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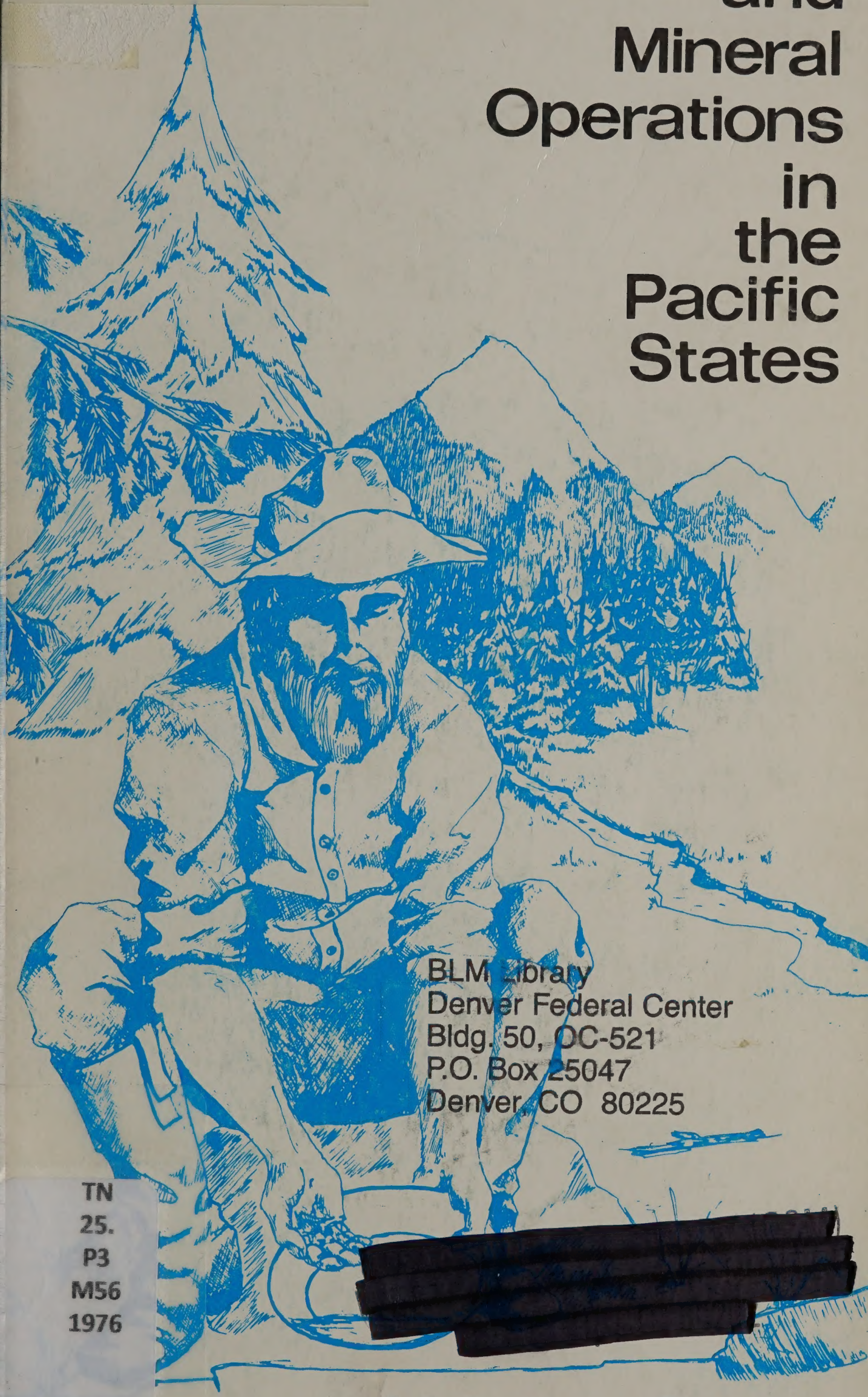

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A Visitor Guide

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MINING AND MINERAL OPERATIONS IN THE PACIFIC STATES

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BY BUREAU OF MINES STATE LIAISON OFFICERS

1976

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INTRODUCTION

Minerals are vital to any industrialized civilization. Annually, the United States uses more than 4 billion tons of new mineral materials, or about 40,000 pounds per person—about half being mineral fuels and the other half being metals and nonmetallics. Stable and economic domestic mining, mineral, metal, and mineral reclamation industries are essential to the economy. The value of United States energy and processed materials of mineral origin exceeds $200 billion annually. Although a number of minerals are imported, especially some designated as "strategic and critical," most U.S. mineral supplies are derived from the domestic mines and processing facilities that you will be seeing, reading about, and visiting as you use this visitor guide. We hope you enjoy your experiences.

This pamphlet, a guide to mining and mineral operations that may be observed or visited and some other points of interest relating to minerals, is intended to aid tourists and students who are interested in mining. Some may wish to study our Nation's romantic past; others may plan to enter the minerals industry as a career; still others may have a primary interest in conservation practices. The pamphlet is also intended to aid State and local officials, Chamber of Commerce, and mining firms in answering some of the many questions of tourists and students.

Six visitor guides have been prepared covering mining operations in the United States. The regions covered by these guides are the New England and Mid-Atlantic States, the South Atlantic States, the North-Central States, the South-Central States, the Rocky Mountain States, and the Pacific States.

The text presents interesting highlights about mines and mineral operations that travelers may see from the highways. Longer descriptions of mines and plants that can be visited sometimes are provided. The mines mentioned are representative examples and are those most easily observed from, or are near, major highways. There are many others that are operating but are more remote. Selected references for detailed study are also included.

The Bureau of Mines publishes a Minerals Yearbook each year that summarizes the national production and status of each mineral commodity. The mineral industry production and status for each State are described in separate chapters. The Yearbook may be purchased from the Superintendent of documents, U.S. Government Printing Office, Washington, D.C.

20402. Separate chapters are available free from Publications Distribution Branch, Bureau of Mines, U.S. Department of the Interior, 4800 Forbes Avenue, Pittsburgh, Pa. 15213.

Students who have a deep interest in some branch of mining will find most mine managers willing to help, even though the mine may not be open to casual tourists.

If you leave well-traveled highways to visit ghost towns, tell someone where you are going and when you expect to be back. You should also inquire locally about road conditions before traveling unpaved or unimproved roads.

Bring your camera. Many prize-winning photographs have been obtained at the areas mentioned in this pamphlet.

ACKNOWLEDGMENTS

Acknowledgments are due those who helped prepare this pamphlet. State geologists, State Offices of Information, Chambers of Commerce, mine managers, and Bureau personnel have freely contributed data.

CAUTION

Remember that abandoned mines are death traps. Stay out of them. Old shafts often cave near the surface and form a funnel-shaped opening. Unwary visitors have been trapped in these funnels. Stay away from old shafts!

Always use available guide services. Mine openings (tunnels, adits, open pits) should never be entered except with a competent guide.

Sometimes the air is bad in abandoned mines and is not safe to breathe. Explosive gas may also be present. Gases frequently come from the rocks themselves, but during active operations, they are swept out of the mine by the controlled ventilating current.

Remember, too, that even the oldest mines usually are private property. Most mine owners do not object to the collection of a few mineral specimens (some do charge a fee), but all object to touring vandals, who wantonly destroy buildings and equipment, or to inexperienced trespassers, who present a hazard to themselves, the property and the owners.

ALASKA

by
Alfred L. Service

When Alaska was purchased from Russia in 1867, many critics of the purchase called it "Seward's Folly," referring to the Secretary of State who negotiated the purchase. The price was 7.2 million American dollars; since the purchase date, the great land of Alaska has contributed nearly $2.0 billion worth of minerals and fossil fuels. Headlines in Seattle newspapers in 1887 brought hoards of prospectors and miners, hangers-on, and legitimate businessmen to the Klondike, on to Dawson, and then to Circle and the interior of Alaska. More recently, headlines reading "Oil Discovered at Prudhoe Bay, Alaska," started what will probably be the last big rush in the last frontier. Oil reserves in Prudhoe Bay are probably the largest source of petroleum in the United States, and their development will contribute additional billions of dollars to the already impressive total mineral production of Alaska. Gold, tungsten, fluorite, tin, platinum, coal, and barite are among the minerals mined in Alaska today.

There are three ways to go to Alaska, and each one has its advantages, depending on time, expense and facilities. Several airlines fly from the contiguous 48 States to various cities in Alaska, and schedules will meet almost any need. The Southeast Alaska Ferry System leaves Seattle several times a week and stops at Ketchikan, Wrangell, Petersburg, Juneau, Haines-Port, Chilkoot, Skagway, and Sitka. Pickup campers and trailers can be loaded on the ferry for Alaska. Vehicles can be off-loaded at Skagway, put on flatcars, and sent by rail to Whitehorse; there the traveler joins the Alaska Highway. Vehicles also may be off-loaded at Haines, where the visitor can follow Alaska Highway 7 to Canada's Yukon Territory, then northwest to Haines Junction and the Alaska Highway. The third way to go to Alaska is to drive the 1,520 miles of the Alaska Highway from Dawson Creek, British Columbia, to Fairbanks, Alaska. Any of these trips are well worth taking, and each provides the traveler with its own unique scenery and interests.

MINES YOU CAN SEE FROM THE HIGHWAY

Most of the mines that can be seen from Alaska's transportation net are relics of bygone days and are described under "Ghost Towns and Historical Sites."

Marine Highway (Alaska Ferry System).—The Treadwell group and Alaska-Juneau gold mines can be seen from the Alaska State Ferry as it sails northward in Gastineau Channel to the Port of Juneau. The Treadwell mines, off the port side on Douglas Island, were world famous as an example of highly efficient low-cost mining (map location 1). From 1885 to 1922, the Treadwell group produced more than $67 million from ores averaging $2.34 per ton milled. This was the lowest grade lode gold ore produced in the world at a profit; dividends of $0.85 per ton were received. In 1917, ground movement along a fault opened some of the lower workings to seawater, and after several years, the mines were permanently closed. A large glory hole and cave-in are all that remain of this once large and bustling mine. **1**

2 The remains of the Alaska Juneau gold mine are on the hillside off the starboard side of the ship as the Port of Juneau is approached (map location 2). Mining even lower grade ore than the Treadwell group, the Alaska Juneau mine produced $81 million in gold from 88.5 million tons of mine-run ore. Dividend payments started in 1930 when a highly efficient ore/waste sorting system was implemented. The mine closed in 1944 after more than $14 million in dividends was paid.

3 **Alaska 6.**—About 10 miles northeast of Fairbanks, on Engineer Creek, there is one of the old gold dredges that can be visited during the summer months (map location 3). Wandering around the dredge, one can see thaw points used to thaw frozen ground ahead of the dredge; 12–inch and 18–inch pipe with large valves was used to bring water to the dredge ponds, pumps, hydraulic giants, and other equipment used to keep a gold dredge on the move.

4 **Alaska 3.**—Ester, about 10 miles southwest of Fairbanks, was one of the large gold camps in the Fairbanks area (map location 4). The highway passes through the mined area, and the visitor can see tailings piles and steep cuts that were hydraulicked through 200 or more feet of fine clayey muck called loess. This old camp was maintained up until the 1950's to house dredge crews working for the Fairbanks Exploration Co. The boarding house and several other old buildings have been restored and are being used as a hotel, saloon, etc. Here the Alaskan visitor can hear the poems of Robert Service recited in an atmosphere of sawdust on the floor, crude lights, and shovels and picks such as those used by the placer miners many years ago.

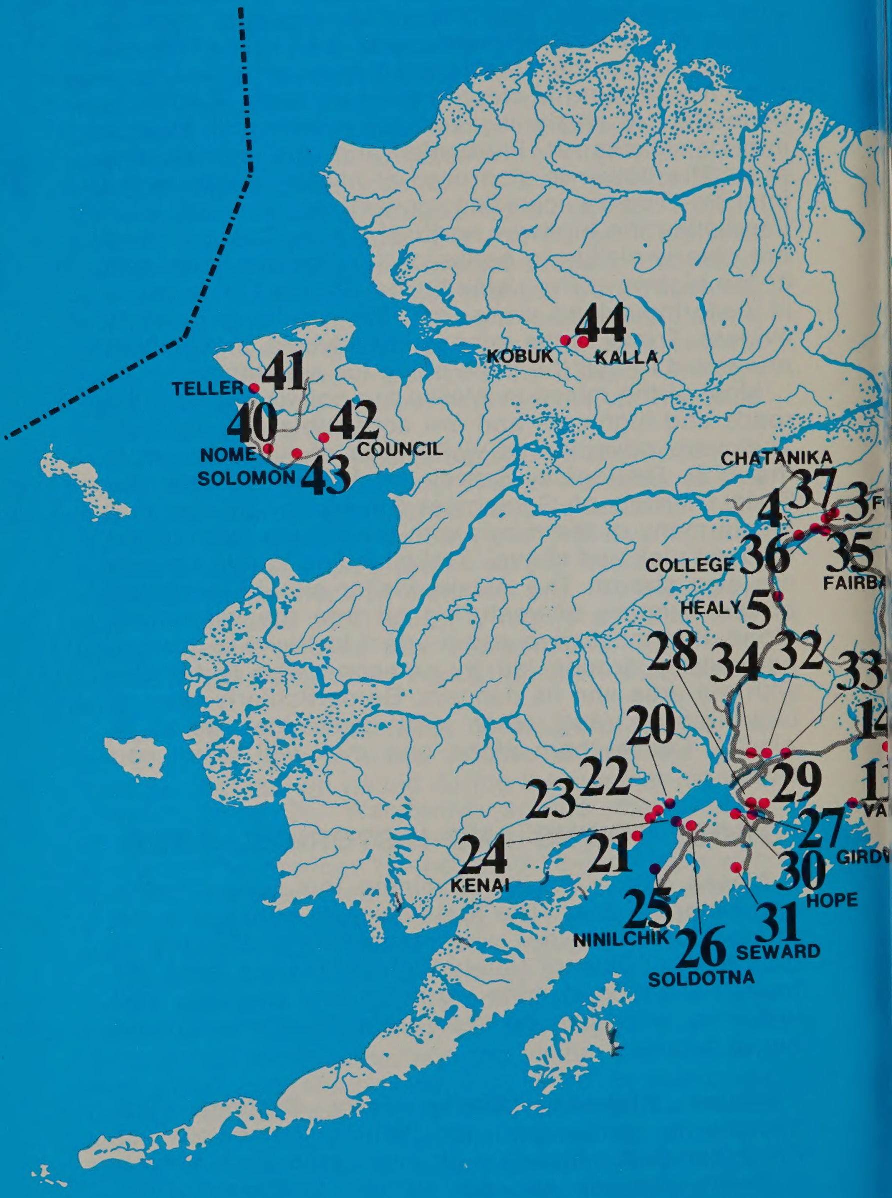
Healy is about 20 miles north of the main entrance to Mt. McKinley Park on the new Anchorage-Fairbanks Highway (Alaska 3) and 250 miles north of Anchorage (map location 5). The only producing coal mine in Alaska is the Usibelli coal mine just east of Healy. Coal mined in the area is used to provide fuel for a mine mouth thermal electric plant at Healy. Electricity generated at Healy is used for power and heat in interior Alaska at Fairbanks and the surrounding area. The power is also used at military bases in the interior. Towers carrying powerlines can be seen paralleling the highway north of Healy. Coal outcrops are clearly visible in banks of the Nenana River east of the highway. The Usibelli Coal Mining Co. is active in restoring mined areas, and the results are clearly evident. Travel to the mine is not advised, and visitors are asked to call the mine office for assistance. 5

Most of the mines in Alaska are not visible from the roads and highways and are accessible only by trail. The more adventurous visitor can obtain maps from the U.S. Geological Survey in Anchorage and the State Division of Geological Survey in College that locate many of the mines with the familiar sign of the crossed pick and shovel. Trails leading to these mines are also shown. The Alaska visitor should be aware of the dangers of venturing off into the wilderness alone. It is most wise and prudent to travel in groups, particularly groups led by someone who is familiar with the area and its dangers. Be particularly wary of bear, moose, and other wild game that thrive in Alaska. Leave them alone and they will leave you alone.

GHOST TOWNS AND HISTORICAL SITES

Alaska has a wealth of mining lore, ghost towns and historical sites. The State owes its heritage to the prospector and miner who responded to the lure of gold in the "Days of Ninety Eight." Many of these old towns, abandoned mine workings and dredges, and historical sites can be seen from the transportation net of Alaska.

Marine Highway (Alaska Ferry System).—The present-day lumbering and fishing community of Ketchikan is the first stop on the Alaska State Marine Highway System as one travels northward from Seattle. The ferry passes Kasaan Peninsula a short distance north of Ketchikan. This area was the scene of considerable mining activity during the late 1800's and early 1900's.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NINILCHIK
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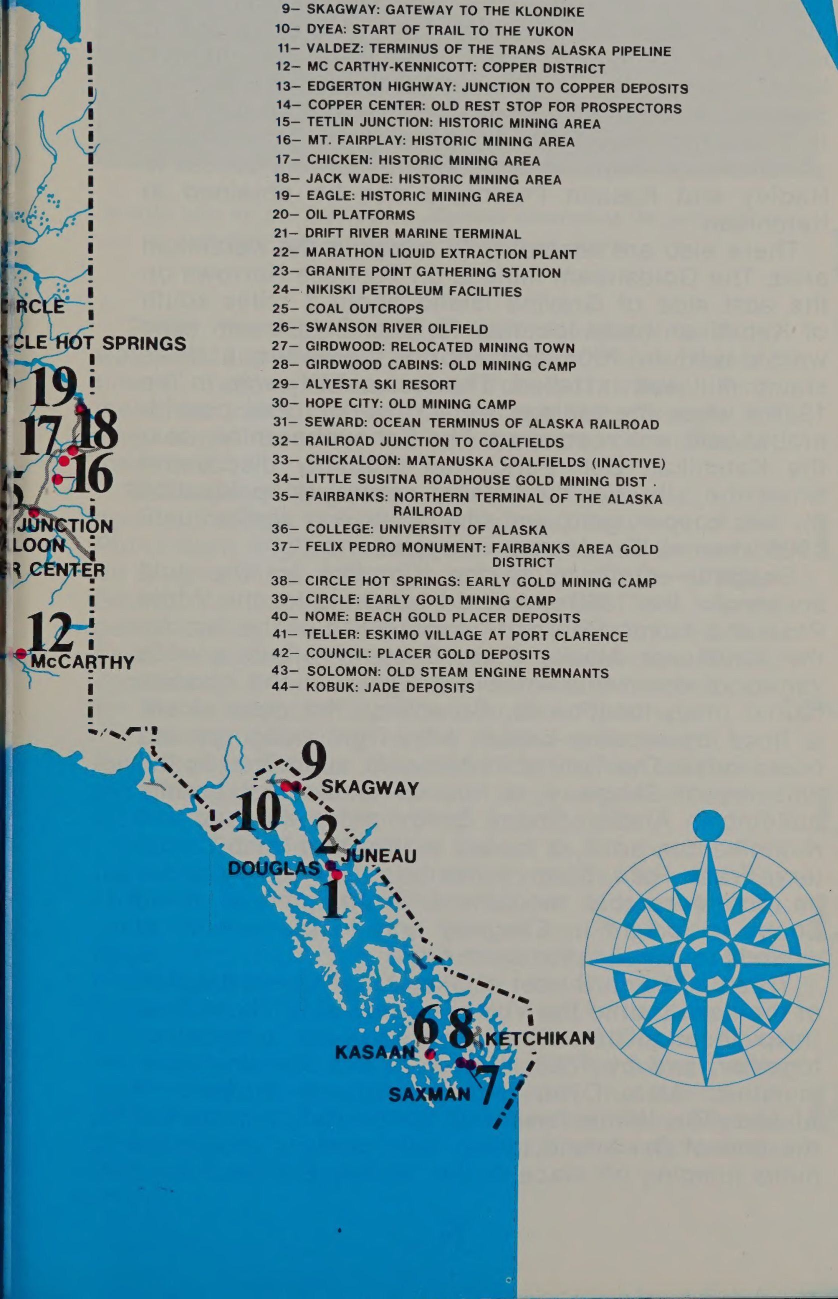
SEWARD
SOLDOTNA

LEGEND

1– TREADWELL GOLD MINES
2– ALASKA JUNEAU GOLD MINE
3– OLD GOLD DREDGE
4– ESTER: OLD GOLD MINING CAMP
5– USIBELLI COAL MINE
6– OLD GHOST TOWN
7– GOLDSTREAM GOLD MINE (INACTIVE)
8– SCHOENBAR COPPER MINE (INACTIVE)
9– SKAGWAY: GATEWAY TO THE KLONDIKE
10– DYEA: START OF TRAIL TO THE YUKON
11– VALDEZ: TERMINUS OF THE TRANS ALASKA PIPELINE
12– MC CARTHY-KENNICOTT: COPPER DISTRICT
13– EDGERTON HIGHWAY: JUNCTION TO COPPER DEPOSITS
14– COPPER CENTER: OLD REST STOP FOR PROSPECTORS
15– TETLIN JUNCTION: HISTORIC MINING AREA
16– MT. FAIRPLAY: HISTORIC MINING AREA
17– CHICKEN: HISTORIC MINING AREA
18– JACK WADE: HISTORIC MINING AREA
19– EAGLE: HISTORIC MINING AREA
20– OIL PLATFORMS
21– DRIFT RIVER MARINE TERMINAL
22– MARATHON LIQUID EXTRACTION PLANT
23– GRANITE POINT GATHERING STATION
24– NIKISKI PETROLEUM FACILITIES
25– COAL OUTCROPS
26– SWANSON RIVER OILFIELD
27– GIRDWOOD: RELOCATED MINING TOWN
28– GIRDWOOD CABINS: OLD MINING CAMP
29– ALYESTA SKI RESORT
30– HOPE CITY: OLD MINING CAMP
31– SEWARD: OCEAN TERMINUS OF ALASKA RAILROAD
32– RAILROAD JUNCTION TO COALFIELDS
33– CHICKALOON: MATANUSKA COALFIELDS (INACTIVE)
34– LITTLE SUSITNA ROADHOUSE GOLD MINING DIST .
35– FAIRBANKS: NORTHERN TERMINAL OF THE ALASKA RAILROAD
36– COLLEGE: UNIVERSITY OF ALASKA
37– FELIX PEDRO MONUMENT: FAIRBANKS AREA GOLD DISTRICT
38– CIRCLE HOT SPRINGS: EARLY GOLD MINING CAMP
39– CIRCLE: EARLY GOLD MINING CAMP
40– NOME: BEACH GOLD PLACER DEPOSITS
41– TELLER: ESKIMO VILLAGE AT PORT CLARENCE
42– COUNCIL: PLACER GOLD DEPOSITS
43– SOLOMON: OLD STEAM ENGINE REMNANTS
44– KOBUK: JADE DEPOSITS

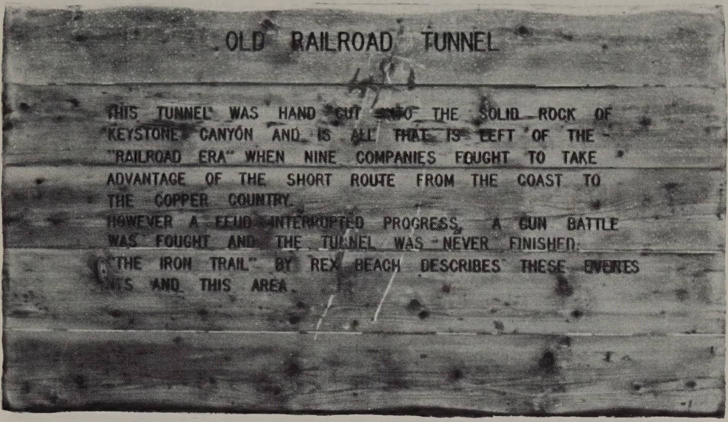


6 The ghost town of Hadley is on Kasaan Peninsula at Lyman Anchorage about 30 air miles from Ketchikan (map location 6). At one time, Hadley was the biggest copper mining town in southeast Alaska and possibly in the whole territory. The town had a large hotel, general store, a sawmill, and an operating copper smelter. Copper ore was first found on Kasaan Peninsula in 1867 at the Copper Queen mine, but precise information concerning the beginning of Hadley is clouded and the date ranges from 1897 to 1902. Kasaan copper occurs in copper-bearing magnetite deposits, and little attention was paid to iron in the old days. More than 650,000 tons of ore, valued at more than $6 million, was produced in the district. Mines feeding the Hadley smelter were the Mamie, Stevenstown, Mount Andrew, Iron King, Poorman, and It. Trails that lead to most of the mines from Hadley are shown on maps. Information concerning access to Hadley and Kasaan Peninsula can be obtained in Ketchikan.

7 There also are several gold mines in the Ketchikan area. The Goldstream mine is on Tongass Narrows on the east side of Gravina Island about 3 miles south of Ketchikan (map location 7). The Goldstream mine was staked in 1903 and shortly thereafter, a three stamp mill was installed. The last activity was in the 1930's when the tailings were reworked and considerable gold was recovered. 8 The Schoenbar mine, near the Ketchikan Ball Park, was probably discovered when the city was first being settled (map location 8). This copper, gold, and silver mine was worked until 1906 when all development stopped.

9 Skagway—Gateway to the Klondike for the gold seekers of the 1890's, seaport terminus for the White Pass and Yukon Railroad, and the end of the line for the Southeast Alaska Ferry System—offers a wide variety of entertainment and delights for the Alaskan tourist (map location 9). Broadway, the main street, is lined by weather-beaten false-front buildings and boardwalks. The Trail of 98 Museum, supported by the citizenry of Skagway, is housed in the first granite building in Alaska. Soapy Smith, noted Alaskan and Klondike con artist, is buried in the Gold Rush Cemetery. Frank Reid, Soapy's nemesis, lies nearby under an ornate marble monument. Frank gunned down Soapy in a fight in Skagway only to die himself of wounds received in the same fight.

10 Three miles northwest of Skagway is Dyea, the start of the hard trail to the Yukon by way of Chilkoot Pass (map location 10). Dyea and Skagway progressed together, and by 1898, they were both thriving communities. Also, Dyea had the largest brewery in Alaska. The White Pass and Yukon Railroad spelled the end of Dyea, and today, little remains of that famous jumping off place of the "Ninety-Eighter."


OLD RAILROAD TUNNEL
THIS TUNNEL WAS HAND CUT INTO THE SOLID ROCK OF KEYSTONE CANYON AND IS ALL THAT IS LEFT OF THE "RAILROAD ERA" WHEN NINE COMPANIES FOUGHT TO TAKE ADVANTAGE OF THE SHORT ROUTE FROM THE COAST TO THE COPPER COUNTRY.
HOWEVER A FEUD INTERRUPTED PROGRESS, A GUN BATTLE WAS FOUGHT AND THE TUNNEL WAS NEVER FINISHED.
"THE IRON TRAIL" BY REX BEACH DESCRIBES THESE EVENTS AND THIS AREA.

Historic sign on the Richardson Highway concerning the railroad era and the turbulent period of conflicting railroad claims.

Today, the Alaskan visitor can disembark at Skagway, load his vehicle on a flatcar, and follow the old timers' trail to Whitehorse, Yukon Territory. From there, he can drive to Dawson passing through the very same country the prospectors of yesterday traversed.

Richardson Highway, Alaska 4.—Valdez, pronounced with a long ē, is the ocean terminus of the Richardson Highway (map location 11). The town is **11** on Valdez Arm, which is a part of Prince William Sound. Valdez, destroyed by tsunames (tidal waves) generated by the 1964 Good Friday Earthquake, has been relocated and rebuilt as a prosperous fishing community. It will also be the deepwater ice-free port for the terminus of the Trans-Alaska Pipeline.

The first gathering in the Valdez area was a tent town called Copper City. This community served as the first supply center for the large copper mines at McCarthy and Kennicott (map location 12). **12**

About 80 miles north of Valdez is the junction of the Edgerton Highway, which leads to Chitina, McCarthy, Kennicott in the Wrangell Mountains area (map location 13). Long famous for its cooper deposits, **13** this district is again receiving attention from the present-day prospector. This road is maintained as far as Chitina, and caution is advised when traveling it. Just north of the Edgerton Junction is Copper Center, which was a stopping off place for miners who had crossed Valdez Glacier to reach the interior of Alaska (map location 14). **14** Many never went beyond Copper Center, and others gave up and returned to their homes.

The Taylor Highway, Alaska 5.—The Taylor Highway from Tetlin Junction to Eagle, a distance of 160 miles, takes the visitor through some of the historic
15 mining areas that give Alaska its great heritage (map location 15). Mount Fairplay (16), Chicken (17), Jack
16 Wade (18) Eagle (19) and Fortymile country all live again as you drive that historic route. Fortymile country
17 was opened up by miners coming down the Yukon to Eagle from Dawson; they then spread out and pros-
18 pected the areas south of Eagle. U.S. Geological Survey Bulletin 1281, "Geology Along the Taylor Highway
19 Alaska," is a must for anyone driving this scenic route. Prepared as a guide, this report is available at Geological Survey Distribution Centers in Anchorage, Alaska, Menlo Park, Calif., and Spokane, Wash., as well as from the U.S. Government Printing Office, Washington D.C.

Sterling Highway.—Cook Inlet is a 30-mile-wide estuary extending about 220 miles southwestward from Anchorage to Shelikof Strait. On the approach to Anchorage International Airport, the visitor has the
20 opportunity of seeing from the air 13 oil platforms that produce both oil and natural gas (map location 20). After dark, the gas safety flares stand out like giant torches. Companies operating platforms include Atlantic Richfield Co., Marathon, Shell, AMOCO,
21 Union, Phillips, Texaco, and Mobil. The Drift River Marine Terminal (21), Marathon Liquid Extraction
22 Facility (22), and Mobil's Granite Point Gathering Station (23) can be seen on the west side of the Inlet by
23 visitors traveling by air. Tours through the Nikiski Marine Terminal, Standard Oil Co. of California Refinery, Collier NH_3 Plant, Tesoro Refinery, and
24 Phillips Liquid Natural Gas Plant can be arranged (map location 24).

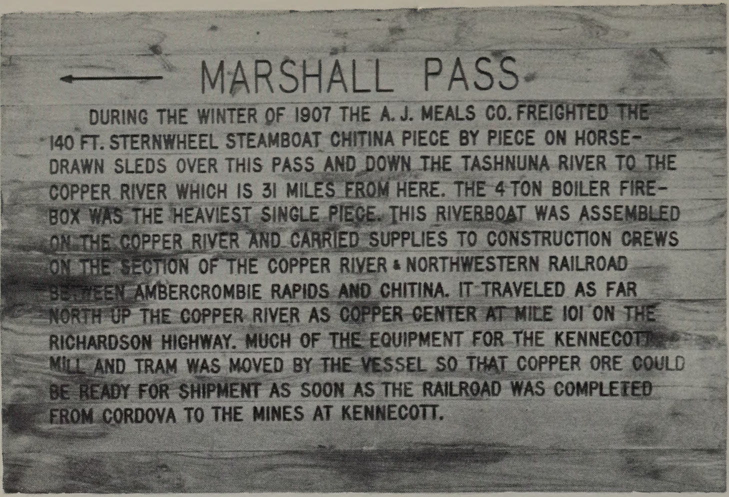
Large reserves of subbituminous coal are also found on both sides of the inlet. Outcrops of coal can be seen in the steep high cliffs rising from the shore
25 of Cook Inlet between Ninilchik and Homer (map location 25). The Swanson River Oilfield on the east
26 side of Cook Inlet is Alaska's only producing onshore field at the present time (map location 26). It is in the Kenai National Moose Range and is accessible by the scenic Swanson River Road, which is about 13 miles northeast of Soldotna. This road was built by Standard Oil of California to provide access and support for drilling and producing operations in the oilfield. There are several excellent fishing areas in the Range, and it is not uncommon to see black bear and moose.

27 Girdwood is about 25 miles southeast of Anchorage on the Alaska Railroad (map location 27). It was named after James E. Girdwood, a miner, in 1896. Tidal waves caused by the Good Friday Earthquake

28

of 1964 wiped out the old town, and it was relocated to its present site. Girdwood Cabins, an old mining camp, is about 5½ miles northeast of Girdwood on Crow Creek (map location 28). It has been rehabilitated as a tourist attraction and offers the opportunity to pan for gold and to explore old cabins and trails used by the miners in the 1890's. Girdwod also is the gateway to Alyeska Ski Resort, Alaska's finest facility

Old railroad tunnel that was never completed.



← MARSHALL PASS

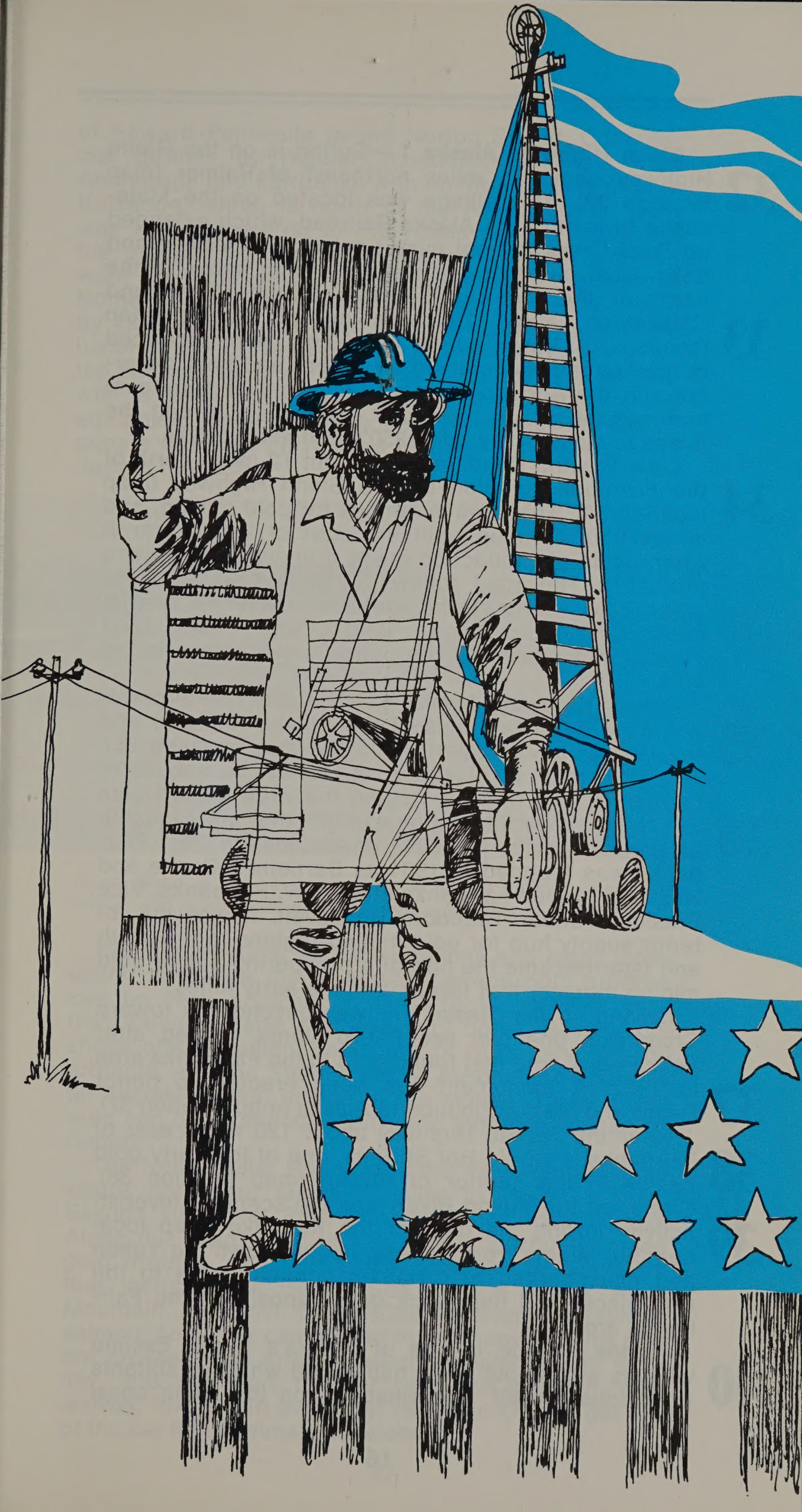
DURING THE WINTER OF 1907 THE A. J. MEALS CO. FREIGHTED THE 140 FT. STERNWHEEL STEAMBOAT CHITINA PIECE BY PIECE ON HORSE-DRAWN SLEDS OVER THIS PASS AND DOWN THE TASHNUNA RIVER TO THE COPPER RIVER WHICH IS 31 MILES FROM HERE. THE 4 TON BOILER FIREBOX WAS THE HEAVIEST SINGLE PIECE. THIS RIVERBOAT WAS ASSEMBLED ON THE COPPER RIVER AND CARRIED SUPPLIES TO CONSTRUCTION CREWS ON THE SECTION OF THE COPPER RIVER & NORTHWESTERN RAILROAD BETWEEN AMBERCROMBIE RAPIDS AND CHITINA. IT TRAVELED AS FAR NORTH UP THE COPPER RIVER AS COPPER CENTER AT MILE 101 ON THE RICHARDSON HIGHWAY. MUCH OF THE EQUIPMENT FOR THE KENNECOTT MILL AND TRAM WAS MOVED BY THE VESSEL SO THAT COPPER ORE COULD BE READY FOR SHIPMENT AS SOON AS THE RAILROAD WAS COMPLETED FROM CORDOVA TO THE MINES AT KENNECOTT.

Historic sign on Marshall Pass, which is the highest pass on the Richardson Highway.

29 and host to a World Cup Race in 1973 (map location 29). Ski lifts operating during the summer months provide a breathtaking view of Turnagain Arm and the Chugach Mountains.

30 Hope is 85 miles, by highway, south of Anchorage on the south side of Turnagain Arm. It is a small village on the north end of Kenai Peninsula near the mouth of Resurrection Creek, 7 miles northwest of Sunrise. A mining camp originally called "Hope City" was established in 1896; Hope Post Office was established in 1897 (map location 30). This area was the scene of considerable mining activity, and several abandoned hard rock gold mines can be seen. Swetmann Camp at the head of Palmer Creek Canyon has camping and picnicking, and fishing is excellent. Several old hard rock gold mines are accessible from the road by foot. Porcupine Creek Camp, maintained by U.S. Forest Service, has 24 camping and 6 picnicking sites and features both hunting and fishing. Highways are maintained year round, and the scenery is spectacularly beautiful both summer and winter. Spawning salmon can be seen in Resurrection Creek during July and August.

31 Seward is 129 miles south of Anchorage at the ocean terminus of the Alaska Railroad and northwest end of Resurrection Bay (map location 31). The town, named after William Seward who negotiated the purchase of Alaska (1861–69), was founded in 1902 by surveyors from the Alaska Railroad. Alaska 1 (Seward Highway) traverses the Chugach Range and the Kenai Mountains. Mining activity and abandoned gold mines are found on both sides of the highway along Granite Creek, Canyon Creek, and Salmon Creek.



Glenn Highway, Alaska 1.—Sutton is on the Glenn
32 Highway about 11 miles northeast of Palmer (map location 32). This village was located on the Matanuska Branch of the Alaska Railroad, which extended up Eska Creek to coal mine tipples at Jonesville and Eska. Coal outcrops are visible in high banks to the north of the highway between Moose Creek and
33 Chickaloon, about 15 miles beyond Sutton (map location 33). Large quantities of coal were produced in the Matanuska coalfield for power and heat generation in the Anchorage area. Discovery of petroleum and natural gas in the Cook Inlet Basin forced the mines to close in the late 1950's and early 1960's.

Little Susitna Roadhouse is about 12 miles north of
34 the Fishhook Junction on the Glenn Highway (map location 34). This area is famous for gold mining, and mines flourished up until the start of World War II when costs of production made it impossible to mine profitably. The road follows Little Susitna River to Idaho Peak where the Independence Mine ski area is located. Independence, Gold Cord, Fern, and Talkeetna are some of the better known mines in the area.

Steese Highway, Alaska 6.—The City of Fairbanks
35 is the northern terminus of the Alaska Railroad and the largest city in interior Alaska (map location 35). The University of Alaska is in College, a suburb of Fairbanks, and anyone visiting the area should plan
36 to see the many interesting exhibits that are available at the University Museum (map location 36). Fairbanks was founded in 1901 as Barnette's Cache and was later named Fairbanks after C. W. Fairbanks, Vice President under Theodore Roosevelt. It was the interior supply hub for gold mining regions to the north and later became the hub of a prospering placer gold mining industry that lasted until the early fifties.

Driving on the Steese Highway beyond Fox toward Chatanika, one can see Pedro Dome, named after Felix Pedro, who first found gold in the Fairbanks area
37 in 1902. A monument has been erected to honor Pedro and his contribution to Alaska (map location 37).

Near the Steese Highway about 120 miles east of
38 Fairbanks is Circle Hot Springs, one of the early gold camps in the interior of Alaska (map location 38). Circle, on the Yukon River, was the scene of feverish
39 activity during the days of the Klondike (map location 39). Miners from Dawson floated down the Yukon and disembarked at Circle to continue west to the rich placer and hard rock gold deposits in the Fairbanks area.

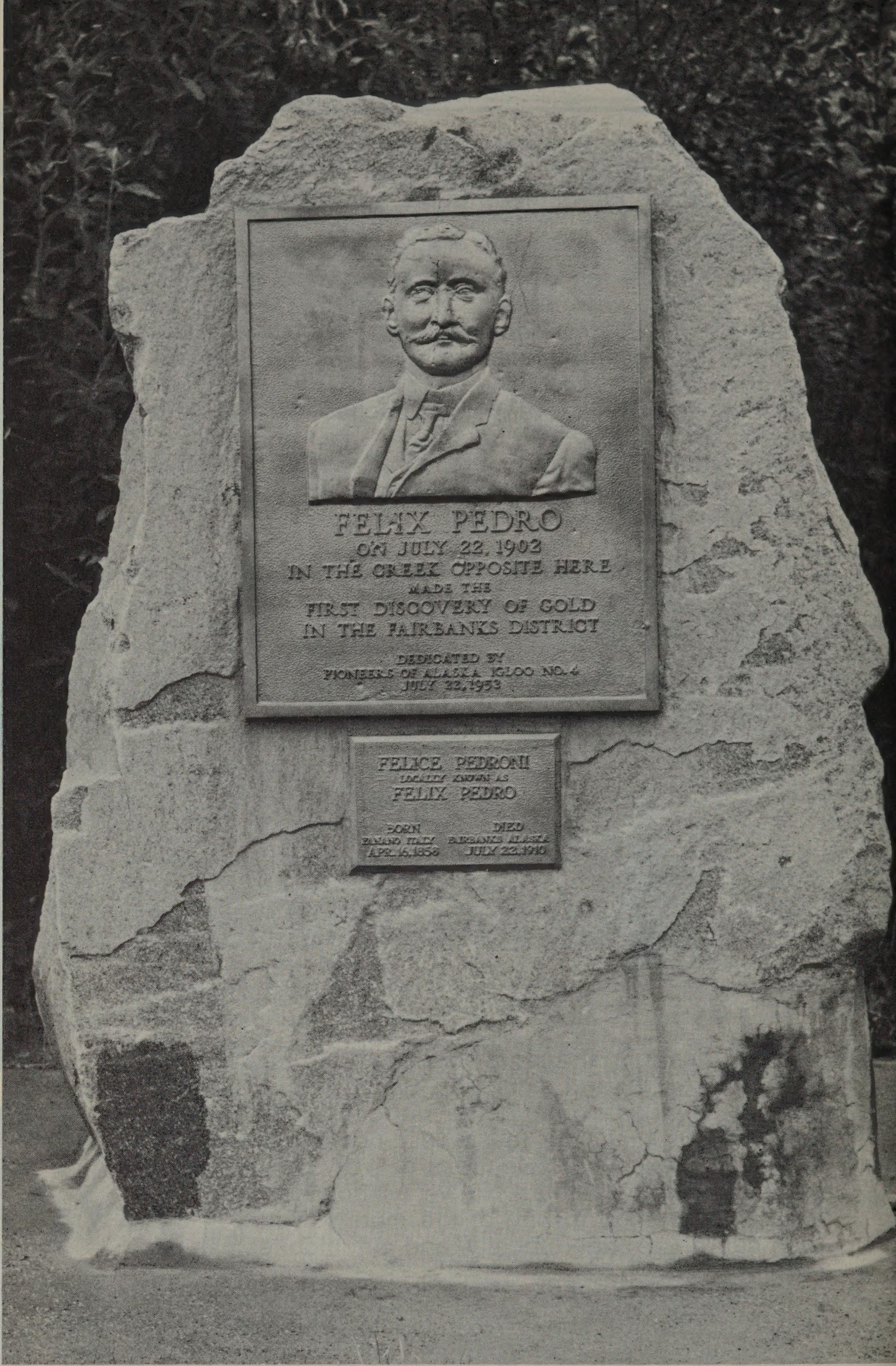
Fly-Ins.—Nome is one of Alaska's larger Eskimo
40 villages with about 2,500 native and white inhabitants (map location 40). The village is on the south coast

of Seward Peninsula facing Norton Sound. Commercial airlines fly regular schedules to Nome from Anchorage and Fairbanks with an intermediate stop at Kotzebue, which is north of the Arctic Circle. Gold was first discovered in the Nome area in 1888, but the prospectors felt the deposits were too lean and went on their way. Several years later, the famous Nome Beach Placer Deposits were discovered, and by 1898, one of the most exciting rushes in Alaska's history started. News of the big strike spread, and by the summer of 1900, the Nome beaches were packed with a solid mass of humanity, tents, and mining equipment. Some estimate there were 30,000 to 35,000 people crowded on Nome's beaches during the early days of the rush.

Hope village as it looks today. It was once a thriving community serving gold miners working in the surrounding hills.

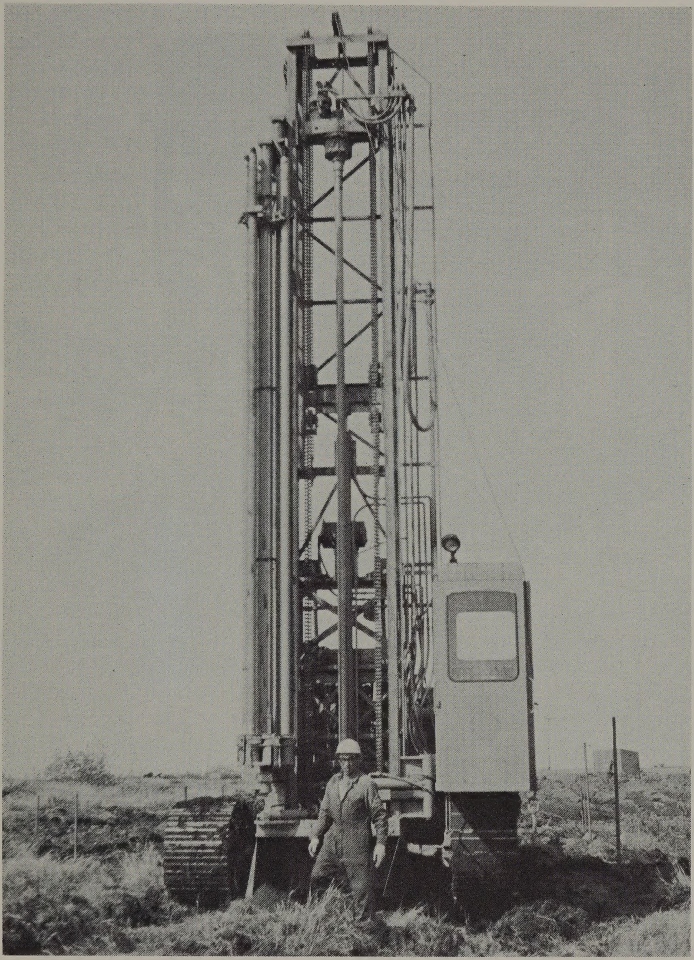
Nome has tourist accommodations and many interesting things for the sightseer. Several gold dredges can be seen adjacent to the airport, which is built from tailings made by these very boats. Several gift shops offer excellent selections of ivory carvings and artifacts, and the Sunarit Native Association operates an excellent shop in one of the motels. Tours in the area can be arranged locally, and automobiles can be rented.

The Nome-Teller Road takes the more venturesome visitor northward about 75 miles to Teller, a small Eskimo village at Port Clarence (map location 41). Along this road, the visitor has the opportunity to see gold dredges, reindeer camp, and beautiful scenery that includes the Bering Sea, Sledge Island, Anvil Mountain, and Anvil Creek. Good fishing for grayling, salmon, and trout can be had in the many streams that are crossed. The area is heavily populated with wildlife, and the alert traveler may see bear, moose, wolves, fox, Arctic owls, and reindeer. Do not get out of the car if the animals are close. **41**


FELIX PEDRO
ON JULY 22, 1902
IN THE CREEK OPPOSITE HERE
MADE THE
FIRST DISCOVERY OF GOLD
IN THE FAIRBANKS DISTRICT
DEDICATED BY
PIONEERS OF ALASKA IGLOO NO. 4
JULY 22, 1953
FELICE PEDRONI
LOCALLY KNOWN AS
FELIX PEDRO
BORN
FANANO ITALY
APR. 16, 1858
DIED
FAIRBANKS ALASKA
JULY 22, 1910

Felix Pedro Monument near Fairbanks, Alaska, honoring the man who first found gold here in 1902.

42 The Nome-Council Road traverses similar terrain paralleling Norton Sound and Solomon River to the village of Council (map location 42). The Niukluk River flows into the Solomon at Council; this is where the first gold discoveries in the Nome area were reported. To the east, the road passes through the village of the King Islander where native dances can be seen. Fort Davis, an Army post established in 1900 to police the riotous miners, is about 2 miles from Nome. At Solomon, the visitor sees the remains of several old steam engines that made up the railroad that ran through the mining district to Council (map location 43). Following the Solomon River, the road passes by an abandoned mining town, waste and tailings piles, and old dredges. One of the few remaining operating dredges in Alaska can be seen a few miles up the river. There is still mining activity in the Council area, and a gold pan might just turn up a few colors.



Rotary drill rig for drilling thaw holes into which heated water is pumped.

43

44 The Eskimo village of Kobuk is north of the Arctic Circle in the heart of jade country (map location 44).

Yuba gold dredge near Nome, Alaska, that last operated in the early 1950's.

It is accessible only by plane, and fares are about $150.00 round trip from Anchorage and $130.00 from Fairbanks via Kotzebue. Jade called the Stone of Heaven is Alaska's State gem rock and can be found on the Dahl Creek claims owned by Ivan Stewart of Anchorage. Gem serpentine, actinolite, silver, gold, and quartz crystals are also found in this area. Grayling fishing is excellent, and wildlife for photographs is abundant. The Stewarts have accommodations available free on request. Food, sleeping bags, head nets, and mosquito dope are a necessity. Tools and equipment for gold panning and gem stone prospecting also are furnished. A spinning or fly rod are advised for the fisherman. Jade in all sizes and other gem stones may be purchased at the mine or from the Stewarts in Anchorage.

FOR MORE INFORMATION WRITE OR VISIT

Chambers of Commerce, Anchorage, Fairbanks, Juneau, Nome, and Valdez, Alaska.

Alaska Department of Economic Development, Division of Tourism, G. A. Russo, Director. Room 315, Goldstein Building, Juneau, Alaska 99801.

Federal Bureau of Mines Liaison Office, Room G–81 Federal Building, Anchorage, Alaska 99501.

Alaska Field Operation Center, Federal Bureau of Mines, P.O. Box 550, Juneau, Alaska 99801.

Alaska Division of Geological Survey, P.O. Box 80007, College, Alaska 99701.

Chugach Gem and Mineral Society, Alaska Visitor Service, c/o Stewart's Photo Shop, 531 4th Avenue, Anchorage, Alaska 99501.

SELECTED REFERENCES

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Alaska, Past and Present, by C. C. Hulley. Binforts and Mort, Portland, Oreg., 1970, 477 pp.

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Geology Along The Taylor Highway, Alaska, by H. L. Foster and T. E. C. Keith, Geological Survey Bulletin 1281, Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 1969, 36 pp. and maps.

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The Milepost, by B. Henning (editor), The Milepost, Box 4–EEE, Anchorage, Alaska 99509, 1973, 543 pp.

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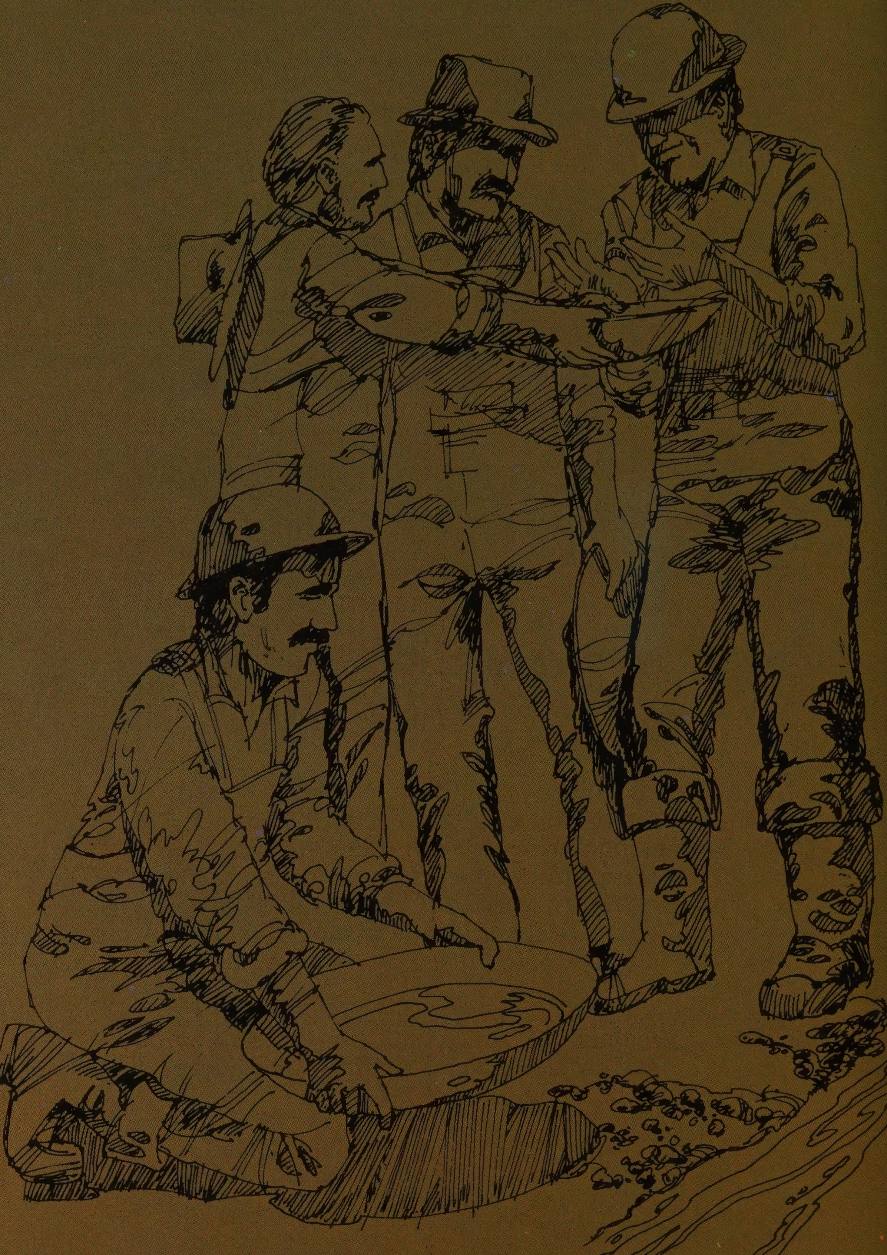


CALIFORNIA

by

Donald Irving and William H. Kerns

The magic of gold stimulated the settlement of California, but today, output of other mineral commodities is more significant to the State's economy. Petroleum production, which began in the 1850's in a small way, bring in more dollars in a single year than the total value of all the gold mined in California since its discovery. California ranks third in the Nation in mineral output. It is first in the value of production of asbestos, borax, diatomite, mercury, rare-earth metals, and sand and gravel. No other State produces so many different mineral commodities.

However, almost everyone is intrigued by California's gold history since the discovery of gold in the tailrace of Sutter's Sawmill on the South Fork of the American River in 1848, near what is now the town of Coloma. This event touched off the most famous gold rush in the history of the world. During 1848 and especially in 1849, mining camps rapidly mushroomed all along the 120–mile strip of the western Sierra Nevada foothills, known today as the Mother Lode Country. The influx of gold seekers became known as the 49'ers and the name eventually was perpetuated in Calif. 49, which traverses the Mother Lode Country from Mariposa in the south to Downieville in the north. Calif. 49 passes through historic towns such as Chinese Camp, Jamestown, Angels Camp, Jackson, Sutter Creek, Placerville (once known as Hangtown), Auburn, Grass Valley, and Nevada City. Along the route or near it are idle but once flourishing mines, including the Eagle-Shawmut, Argonaut, Kennedy, Central Eureka, Empire, North Star, Idaho-Maryland, Malakoff Diggins, and the Sixteen-to-One to name a few.

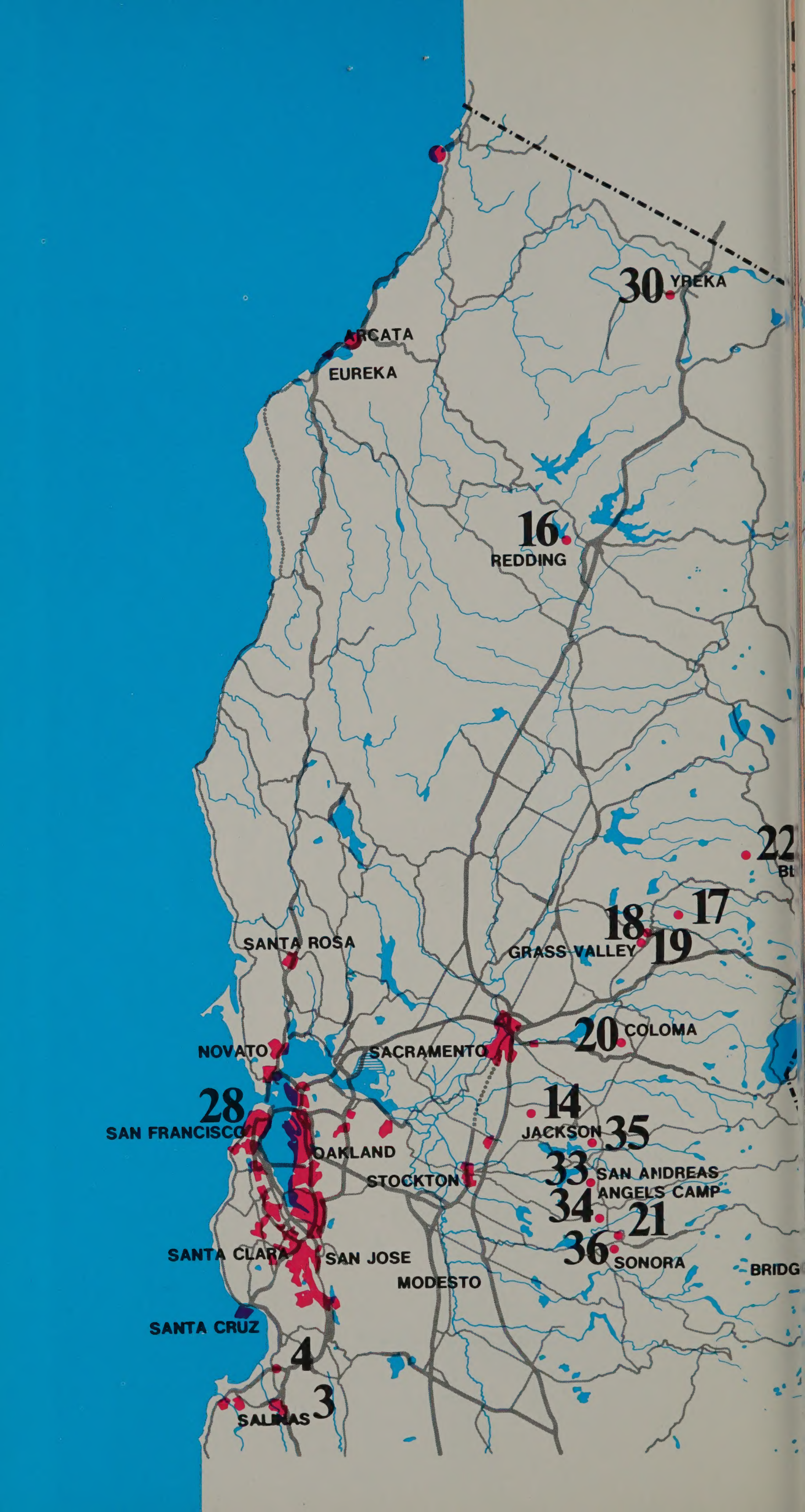
Visitors who have the time and want to review the events of those exciting years in more detail may want to take along a copy of one or more of the books given in the list of selected references at the end of this chapter. They also may find that copies of some of the maps and brochures in the list of selected references will facilitate planning and make their excursions more interesting and more productive. Also, local, county, and State Chambers of Commerce throughout California have maps and literature that will be useful in identifying local points of interest. Many of California's mines are picturesque and in scenic areas. Some have been made into State parks. Bring your camera.

MINES AND PLANTS YOU CAN SEE FROM THE HIGHWAYS

1 **Interstate 15.**—The Mountain Pass rare-earth metals mine is 35 miles east of Baker, Calif., or 57 miles west of Las Vegas, Nev. (map 2, location 1). From the Mountain Pass off-ramp and the town of Mountain Pass, you can see the open pit mine, ore-concentrating mill, and chemical plant. The mine, owned and operated by Molybdenum Corp. of America (Molycorp), is the largest known deposit of rare-earth minerals in the world and is the principal supplier of rare-earth metals and compounds. The primary ore mineral at Mountain Pass is bastnäsite, a fluocarbonate containing principally the metals cerium, lanthanum, neodymium, and praseodymium and small quantities of samarium, gadolinium, and europium.

Although this area was intensively prospected during the last 100 years and many gold, silver, copper, lead, and zinc deposits were found, the rare-earth metals were not recognized until 1949. Molycorp began production in 1951 in a mill erected on the property in 1939 for an unsuccessful venture in gold mining. The new and modern mill, using the flotation process and with a capacity of 1,200 tons of ore per day, was completed in 1966. About 100 tons per day of high-purity bastnäsite concentrate is recovered from the ore in this concentrating plant. Most of this concentrate is treated in the chemical plant on the property, placed in operation in 1965, to produce separate rare-earth metals and compounds. The remaining concentrate is sold to other plants in the United States, Europe, and Japan. Cerium is important as a glass-polishing compound, an ingredient in specialty glass, and in certain steels and metal alloys. Lanthanum and praseodymium are important glass additives. Gadolinium and europium are used for neutron shielding, and europium is essential to the red phosphor for color television tubes. A mixed compound of lanthanum and other metals is extensively used as a catalyst in petroleum refining.

Open pit mine at Mountain Pass rare-earth operation. The entire face from the surface is ore, comprising a 100-year reserve.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YREKA
ARCATA
EUREKA
16
REDDING
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GRASS VALLEY
SANTA ROSA
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COLOMA
NOVATO
SACRAMENTO
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SAN FRANCISCO
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JACKSON
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OAKLAND
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SAN ANDREAS
STOCKTON
ANGELS CAMP
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SONORA
SANTA CLARA
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MODESTO
SANTA CRUZ
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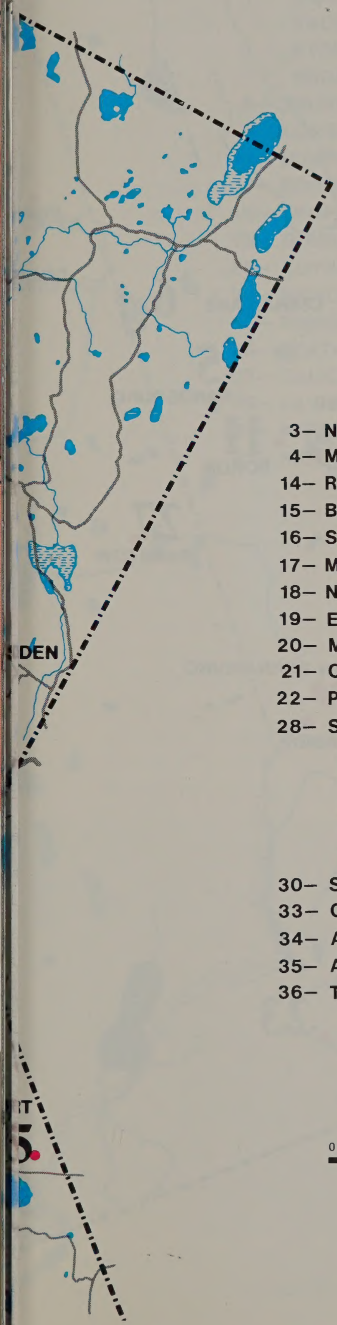
SALINAS



LEGEND

3— NATIVIDAD DOLOMITE MINE
4— MOSS LANDING MAGNESIA PLANT
14— RANCHO SECO NUCLEAR GENERATING PLANT
15— BODIE STATE HISTORIC PARK
16— SHASTA STATE HISTORIC PARK
17— MALAKOFF DIGGINS STATE HISTORIC PARK
18— NORTH STAR POWERPLANT
19— EMPIRE GOLD MINE
20— MARSHALL GOLD DISCOVERY STATE HISTORIC PARK
21— COLUMBIA STATE HISTORIC PARK
22— PLUMAS-EUREKA STATE PARK
28— SAN FRANCISCO;
HISTORY ROOM, WELLS FARGO BANK
BANK OF CALIFORNIA GOLD AND COIN MUSEUM
STANDARD OIL CO. OF CALIFORNIA - A WORLD OF OIL
DIVISION OF MINES AND GEOLOGY
THE OLD MINT
30— SISKIYOU COUNTY GOLD EXHIBITS
33— CALAVERAS COUNTY MUSEUM
34— ANGELS CAMP MUSEUM
35— AMADOR COUNTY MUSEUM
36— TUOLUMNE

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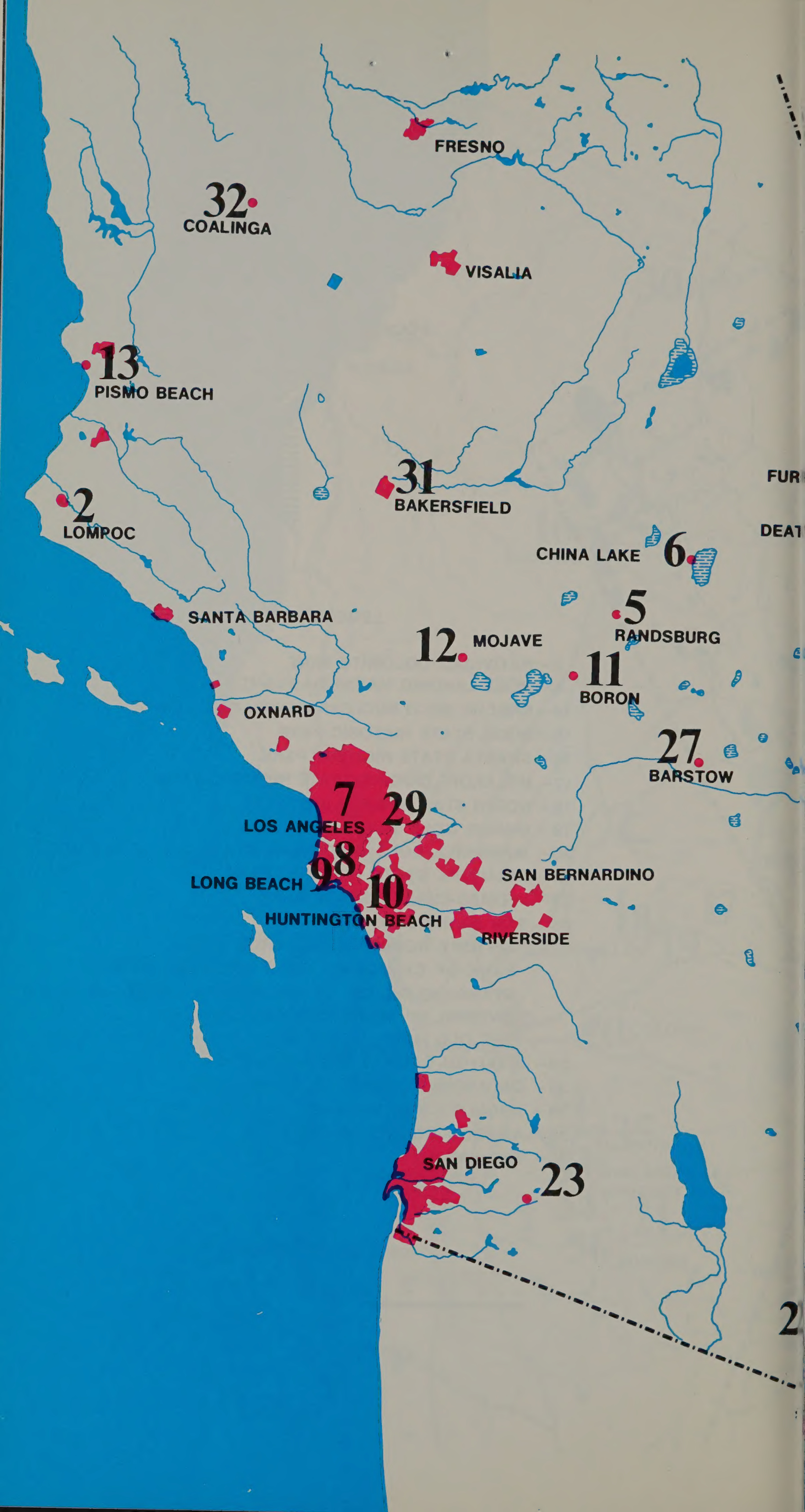
FRESNO
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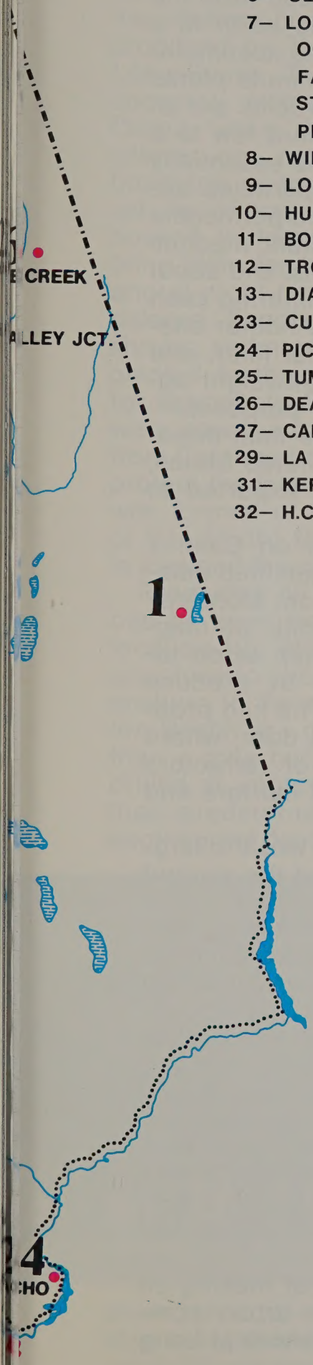
COALINGA
VISALIA
13
PISMO BEACH
31
BAKERSFIELD
2
LOMPOC
FUR
DEAT
CHINA LAKE
6
5
SANTA BARBARA
12
MOJAVE
RANDSBURG
11
BORON
OXNARD
27
BARSTOW
7
29
LOS ANGELES
9
8
LONG BEACH
10
SAN BERNARDINO
HUNTINGTON BEACH
RIVERSIDE
SAN DIEGO
23
2

LEGEND

1– MOUNTAIN PASS RARE-EARTH MINE
2– LOMPOC DIATOMITE MINES
5– RANDSBURG DISTRICT (GOLD,SILVER,TUNGSTEN)
6– SEARLES LAKE BORAX MINES
7– LOS ANGELES,
OCCIDENTAL PETROLEUM CORP., PRODUCTION FACILITIES
STANDARD OIL CO. OF CALIF.,PETROLEUM PRODUCTION FACILITIES
8– WILMINGTON OILFIELD
9– LONG BEACH OILFIELD
10– HUNTINGTON BEACH OILFIELD
11– BORON, MINING & REFINING OPERATION
12– TROPICO GOLD MINE
13– DIABLO CANYON NUCLEAR PLANT
23– CUYAMACA RANCHO STATE PARK
24– PICACHO STATE RECREATION AREA
25– TUMCO GOLD MINE
26– DEATH VALLEY NATIONAL MONUMENT
27– CALICO (MAGGIE MINE)
29– LA BREA TAR PITS
31– KERN COUNTY MUSEUM
32– H.C.BAKER MEMORIAL MUSEUM



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Calif. 1.—The white outcrops of diatomite (famous as the White Hills), the diatomite (diatomaceous earth) open pit mines, and the processing plants of GREFCO, Inc., and Johns-Manville Corp. can be seen from Calif. 1 as you approach the City of Lompoc from the south (map 2, location 2). Diatomaceous earth is a unique sedimentary rock resulting from the accumulation of fossils called diatoms, a class of minute plants that lived in water. These fine-grained particles are an inert form of silica and range in size from a few to a few hundred micrometers; each particle is essentially flat, commonly perforated, and all the particles are loosely packed to yield a highly porous and permeable material. Diatomaceous earth is an efficient medium for the rapid filtration of industrial solutions, and about three-fifths of the production is used for filtering such things as wine and petroleum products. Another one-fifth of the output is used as an industrial filler, and the remainder is used for insulation, lightweight aggregates, pozzolans, and miscellaneous purposes. 2

These deposits at Lompoc supply more than three-quarters of the diatomite output in the United States, and about one-quarter of the output is exported to over 60 countries.

4 At the Moss Landing magnesia plant on Calif. 1 north of Salinas (map 1, location 4), the calcined dolomite is reacted with seawater pumped from Monterey Bay to produce an industrial-grade "milk of magnesia"—magnesium oxide. The magnesium oxide together with additives is fed to kilns to produce periclase, a basic refractories material. The kiln product is used in the refractories plant next door, where over 2,000 different sizes and shapes of refractory brick and block and a variety of sacked mortars and ramming mixes are produced.

The Wilmington field near Los Angeles was the largest oil producer in California in 1972, and the second largest in the United States, with an average of 2,418 producing wells. It yielded more than 70 million barrels of oil in 1972, and cumulative production reached more than 1.5 billion barrels. The field, partly onshore and partly offshore, accounted for 20 percent of California's 1972 oil output. It is the site of the world's largest oilfield repressuring operation, with injection of 3.8 billion barrels of water since 1953 to control subsidence resulting from withdrawal of oil. Pumping wells located along the shore in the Wilmington field can be viewed from the Los Angeles Harbor Scenic Drive south of Calif. 1 en route to the Queen Mary. The wells at this location were directionally drilled beneath the ocean (map 2, location 8). 8

An outstanding and unusual example of making oil operations esthetically appealing to an urban community are the four manmade islands offshore at Long

Beach south of Calif. 1 and directly east of the permanent berth of the Queen Mary (map 2, location 9). The Queen Mary was acquired and refurbished as a tourist attraction using royalties from oil produced from wells drilled on the four islands, which penetrate the offshore portion of the Wilmington field. The oil is produced by THUMS Long Beach Co. for the City of Long Beach. THUMS is an acronym for the operating company formed by Texaco, Humble (now Exxon Corp.), Union, Mobile, and Shell Oil companies. The islands are opposite downtown Long Beach office buildings, apartments, and hotels. On the island nearest to shore, drilling rigs are soundproofed and housed in large sculptured concrete panels resembling high-rise buildings. There are artificial waterfalls, and at night the structures are illuminated with multicolored floodlights. Nearly 200 palm trees, 1,000 shrubs, and numerous ground cover plants were transplanted to the islands. These unique islands, named for astronauts Grissom, White, Chafee, and Freeman, were constructed in 1965 and 1966 using rock barged from Catalina Island to form the outside perimeter and protect the islands from wave action. The interior core was formed of ocean sand dredged from the bottom of San Pedro Bay. Three of the islands are 10 acres in size and the other is 8.8 acres. **9**

Producing oil wells of the Huntington Beach oilfield can be seen from Calif. 1 north of Calif. 39 (map 2, location 10). When oil accumulations under the ocean are close to shore, wells may be drilled from locations onshore to the offshore pools. Some wells at Huntington Beach are drilled from onshore locations to more than a mile out beneath the ocean; some have been drilled at angles up to 70° from the vertical to reach their predetermined bottomhole locations—a difficult engineering feat. **10**

Death Valley's 20-mule borax team. In the background is Black Mountains; 36½-ton loads from Death Valley to Mojave took 10 days for the 165-mile trip. (Courtesy of National Geographic Society.)

5 **U.S. 395.**—The Randsburg district, including the mining ghost towns of Randsburg, Johannesburg, Red Mountain, and Atolia is about 90 miles north of San Bernardino and 20 miles south of China Lake (map 2, location 5). It is an interesting spot to visit. The western part of the district in Kern County has been an important source of gold; the eastern part in San Bernardino County has been largely a source of silver, and the southeastern part near Atolia in San Bernardino County has been an important tungsten producer. Although this region was prospected as early as the 1860's, it was not until placer gold was discovered in 1893 that there was any mineral production. The Yellow Aster mine was located in 1895. The Kelly or California Rand mine was discovered in 1919 and was operated on a major scale through the 1930's. Gold production from the district was substantial in the 1930's and early 1940's. Since then, there has been intermittent prospecting and exploration work. The total gold output of the district is estimated at more than $20 million. During the two World Wars and the Korean war, Atolia was the source of a large quantity of tungsten. In 1973, the only activity reported was at the Minerals Exploration, Inc., 200–ton–per–day mill about 1 mile south of Atolia, where mill tailings from previous operations were being retreated to recover tungsten lost in the first milling.

6 **Calif. 178.**—The plants and brine fields of two of the State's major borax producers can be seen from Calif. 178 about 23 miles northeast of China Lake (map 2, location 6). The Stauffer Chemical Co. plant is on the east side of the highway at Westend, and the Kerr-McGee Chemical Corp. plant is on the west side of the highway at Trona. The brine is pumped from shallow wells that penetrate saturated layers of crystalline saline minerals to the plants where the borax, potash, salt cake, soda ash, lithium compounds, and common salt are recovered and marketed.

Also of interest in Trona is the Trona Gem and Mineral Society Museum and display of minerals from the area. The building is located in the center of town on the west side of the main highway and is plainly marked. It is usually open during the daytime, but if it is closed, call the number listed in the telephone directory for the Society and someone will open the museum.

7 **Los Angeles.**—Locations of mineral-related activities in Los Angeles (map 2, location 7) can best be determined by referring to a city map.

A significant quantity of the petroleum produced in the Los Angeles Basin comes from oil pools in the Los Angeles metropolitan area and offshore from urban sections of southern California. The first commercial production of oil in Los Angeles came in the 1890's, at which time little attention was paid to the appearance

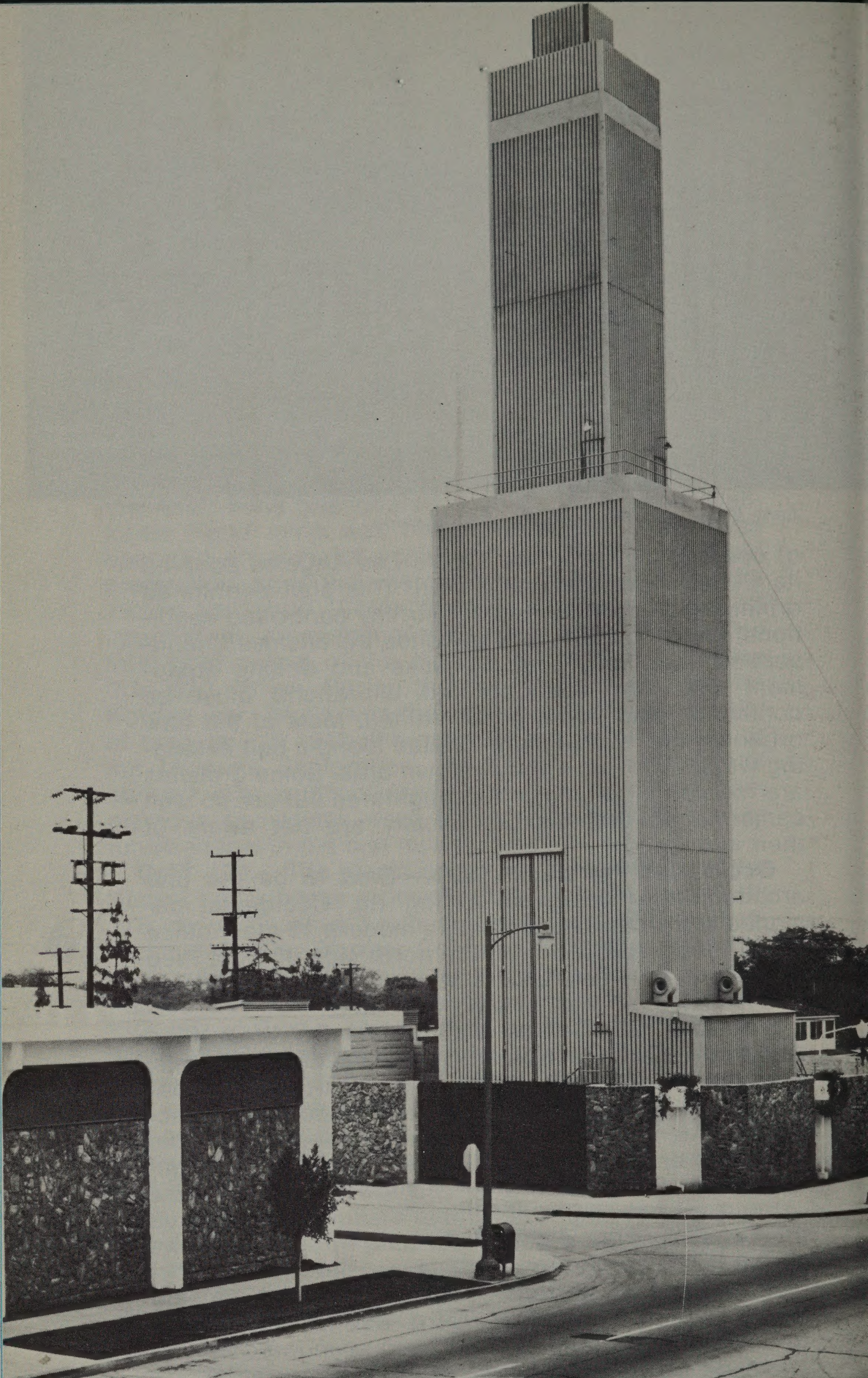
Long Beach – offshore drilling oil production.

of operations, but in the 1950's Los Angeles adopted its Comprehensive Zoning Plan. This plan permits oil drilling and production under strictly controlled conditions, which require that drillsites be enclosed, landscaped, and kept neat. Derricks and drilling equipment must be soundproofed, vibrations must be controlled, and odors be contained. Most of the new urban drilling districts are located along a belt extending westward from the downtown area. Some drillsites are located along major thoroughfares but are so well camouflaged that visitors usually are not aware of their existence.

Occidental Petroleum Corp.—Said to be the first architecturally designed drilling rig, Occidental designed a structure resembling a modern 10-story office building for its drillsite on the north side of West Pico Boulevard between Oakhurst and Doheny Drives in Los Angeles.

Standard Oil Co. of California.—On West Pico Boulevard between Spaulding and Genesee Streets, Standard Oil Co. of California has constructed a building with a 10- to 12-foot-high stone fence that effectively screens drilling and production operations from motorists and pedestrians. The entrance to the structure is on Pico Boulevard. The lower floor contains exhibits of petroleum activities. Visitors can walk up the steps from the ground floor and, through windows on the landings, view the drilling and production activities. A drilling derrick at 130 South San Vicente Boulevard between West Third Street and Beverly Boulevard in Los Angeles has been soundproofed and enclosed behind a concrete block wall.

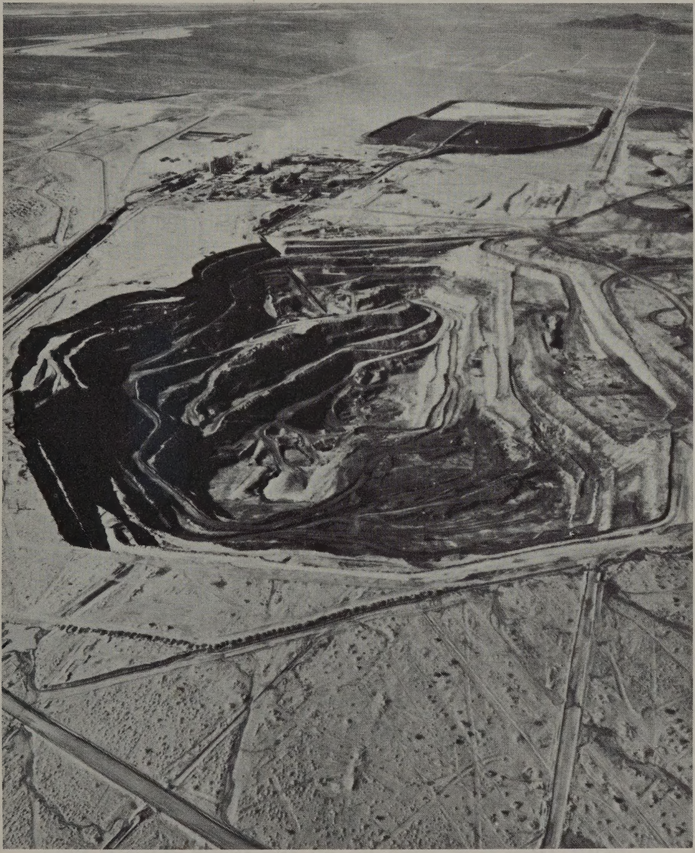
Baldwin Hills (Inglewood oilfield).—A drive south on La Cienega Boulevard in Los Angeles from Rodeo Drive to Slauson Avenue over the Baldwin Hills enables visitors a closeup look at operations in the Inglewood oilfield, one of the largest in California. Many old derricks are still standing. Most producing wells, however, are equipped with pumping units.



This is an architecturally designed and landscaped drill site in west Los Angeles, Calif. (Courtesy of Occidental Petroleum Corp.)

3 **U.S. 101.**—The Natividad dolomite open pit mine, or quarry, and processing plant of Kaiser Aluminum & Chemical Corp. are located in the foothills about 2 miles east of Salinas on U.S. 101 (map 1, location 3). The high-purity dolomite is one of the best in the world for use in a seawater conversion magnesia plant. It is mined, crushed, upgraded by heavy-medium separation, calcined in rotary kilns at the quarry, and trucked to the company magnesia plant 15 miles away at Moss Landing.

Aerial view of open pit borate mine and adjacent processing plants at Boron, Calif. This is the only open pit borate mine in the world. (Courtesy of U.S. Borax and Chemical Corp.)



MINES AND PLANTS YOU CAN VISIT

11 **Calif. 58.**—The United States Borax and Chemical Corp. (U.S. Borax) operation is 2.5 miles north of Boron off Calif. 58, about 30 miles east of Mojave (junction of Calif. 14 and Calif. 58) and 8 miles west of Kramer Junction (junction of U.S. 395 and Calif. 58) (map 2, location 11). Facilities at the U.S. Borax boron

operation include an open pit mine, concentrating plant, a refining plant, and anhydrous boric acid plant. The borax deposit was discovered in 1913 while drilling for water, and beginning in 1927, the higher grade ore was selectively mined for the first 30 years by the room-and-pillar underground method. Since then, the deposit has been mined from an open pit, which is now about 500 feet deep, 3,200 feet long, and 2,500 feet wide. The ore was originally transported to the surface and the treatment plant by truck, but an automatic ore conveyor was installed in 1960 at the 225-foot level. Many varieties of concentrate and refined borate products are made in the plant. Refining processes are primarily those of dissolving, purifying, recrystallizing, and dehydrating.

U.S. Borax maintains a visitors pavilion overlooking the boron pit and treatment facilities. A tape recording giving the history of the operation and describing the operation and products can be heard at the pavilion by punching a button. Pictures and products also are displayed. If you get there at noon on weekdays you may witness the blasting of the ore in the open pit. Also, if you see the guard at the U.S. Borax gate, he will give you a copy of the booklet, "The Story of Borax," and a sample of the borax ore.

12 **Calif. 14.**—Fourteen miles south of Mojave you can take the Rosamond Boulevard offramp off Calif. 14 for 3 miles to the west to the historic Tropico Gold (Burton's) gold mine, mill, and camp (map 2, location 12). For a nominal fee you can take a guided tour of the mill and underground mine during the winter season, October 1 to June 1, every day except Tuesday and Wednesday between 9:30 a.m. and 4:00 p.m., and of the mine only during the summer season, June 1 to October 1. The gold camp and museum, with authentic fully furnished gold-camp buildings and displays of historical heirlooms, are open during the same days and hours listed previously for unescorted tours at a nominal fee.

13 **U.S. 101.**—An increasingly popular attraction is a visit to the new Nuclear Information Center of Pacific Gas and Electric Co. (PG&E), situated 7 miles south of San Louis Obispo on U.S. 101 near the San Luis Bay exit (map 2, location 13). Those who have the time can augment their tour of the Center by arranging to take the 1½-hour free bus tour to an overlook where visitors can see PG&E's big nuclear powerplant under construction. Reservations should be made in advance for the bus tour, which operates between 9:00 a.m. and 3:15 p.m., 7 days per week. The information center also is open 7 days per week—from 9:00 a.m. to 5:00 p.m. Reservations can be made by writing the Diablo Canyon Nuclear Information Center, P.O. Box 592, San Luis Obispo, Calif. 93406, or by a telephone call to (805) 595-2327.

14

Calif. 99.—Rancho Seco Nuclear Generating Plant, completed in 1974 by the Sacramento Municipal Utility District (SMUD), can be reached from Sacramento by traveling 24 miles south on Calif. 99, then 12 miles east on Twin Cities Road Calif. 104 (map 1 location 14). At the plant, nuclear fuel will be used to create the steam to drive the turbines to generate the electric power. The plant will be the largest "dry" nuclear plant in the United States—dry because it is not located on a body of water such as a river or ocean, which usually provides the cooling water to condense spent steam from the turbine. The hyperbolic natural draft cooling towers at Rancho Seco, 425 feet high and 325 feet in diameter, are the prominent features at the site and in the area. Cooling water will be brought by canal from Folsom Dam near Sacramento and placed in a 160-acre reservoir, with a 4-mile shoreline, called Rancho Seco Lake, which will be a public recreation area. A visitors center is located on a prominent high point overlooking the recreation area and plant site, and an audio-visual presentation explaining the construction and operation of the plant can be heard and seen by pushing a button.

A 9-cubic-yard shovel loads borate ore into a 50-ton truck in an open pit mine on the Mojave Desert near Boron, Calif. The ore is hauled to an automatic 1,300-foot conveyor that carries it to processing plants on the surface. (Courtesy of U.S. Borax and Chemical Corp.)

GHOST TOWNS AND HISTORICAL SITES

The Department of Parks and Recreation administers nearly 200 units, including scenic and natural parks and reserves, historical units and museums, ocean beaches, underwater parks, recreation areas, and wayside campgrounds. A general folder describing the California State Park System and folders containing descriptive texts and maps of the individual State units described in the following text may be obtained by writing to the California Department of Parks and Recreation, P.O. Box 2390, Sacramento, Calif. 95811.

Calif. 395.—In 1897, Bodie had a population of more than 10,000, and was said to be "second to none for wickedness, badmen, and the worst climate out of doors." Today, about 5 percent of the town stands just as it has survived the ravages of time, fire, and the elements. Bodie is a genuine California gold-mining ghost town and is maintained in a state of "arrested decay." It was designated a State Historical Park in 1962. The Standard mine and mill surface installations are visible from Main and King Streets. The mine yielded $15 million over a period of 25 years, and its success caused the 1878 rush to Bodie. Stay on the streets and sidewalks when you walk through town. Buildings are unsafe and certain areas are hazardous because of possible open mine shafts. Off-season visitors are cautioned to check at Bridgeport, Mono County seat, for road and weather information before making the trip. The park is on Bodie Road, 13 miles east of its junction with Calif. 395, 7 miles south of Bridgeport (map 1, location 15). **15**

Calif. 299.—Once the county seat of Shasta County and a famous gateway to California's northern gold mining district, Shasta City is now marked by an old brick building restored to its 1861 appearance and a row of old, half-ruined, brick buildings with iron shutters that still swing on massive iron hinges. The former courthouse now is a museum of historical artifacts associated with the boom years during the gold rush and is a central feature of Shasta State Historical Park. The park is located 6 miles west of Redding on Calif. 299 (map 1, location 16). **16**

Calif. 174.—The world-famous Empire gold mine near Grass Valley, which opened in 1850 and continued to produce for over 100 years, is going to be developed by the California Department of Parks and Recreation to demonstrate hard rock gold mining in California. An allocation of $1.5 million has been announced to purchase the mine and its 1,100 acres, which includes a group of handsome stone buildings. The mine is on Calif. 174, about 2 miles southeast of the center of Grass Valley, toward Colfax (map 1, location 19). **19**

Tailings wheel, head frame, and mill at the Kennedy mine, near Jackson, Calif.

Calif. 49.—Placer gold was discovered in the North Bloomfield district (originally called Humbug City) in 1851. Hydraulic mining began in 1853 and by 1855 was a major industry. As more and more gold-bearing gravel was excavated by this placer mining method, the pits became enormous. The Malakoff Diggins pit is more than 7,000 feet long, 3,000 feet wide, and up to 600 feet deep. Hydraulic mining virtually ceased in the 1880's when downstream farmers secured court orders that prohibited the dumping of mine debris into the Sacramento and San Joaquin Rivers and their tributaries. At Malakoff Diggins State Historic Park, visitors can see the largest hydraulic gold mine in the world. Time has mellowed the scars left by the giant water nozzles, giving the pit a timeless appearance. The park museum is open Tuesday through Sunday from 10:00 a.m. to 5:00 p.m. in the summer, open on weekends during the fall and spring, and closed during the winter. The park has 30 primitive family campsites, each with a table, cupboard, and stove. Some of the campsites will accommodate trailers up to 24 feet long or motor homes up to 30 feet long, but there are no electrical hookups. To reach the Malakoff Diggins, first travel west then north of Nevada City on Calif. 49 for 11 miles, then take surfaced Tyler Foote Road east for 8 miles to North Columbia, then take graveled Lake City Road for 4 miles to the park entrance (map 1, location 17). **17**

A portion of the site of the North Star mine at Grass Valley, which closed in 1956, has been set aside by the Nevada County Historical Society. The central exhibit is a 30-foot-diameter Pelton wheel, which at the time of its construction was the largest such wheel ever built to generate power by a high-velocity water jet. It was made of steel, except for a cast-iron hub and bronze buckets. In September 1959, the North Star powerplant was disposed of at public auction, and salvage of scrap metal began, with the 30-foot Pelton wheel left until last. It was dramatically saved from destruction by a "last-minute" donation from an anonymous donor that enabled its purchase. Thus inspired, the New Verde Mines Co., then owner of the land, donated 1.168 acres containing the wheel and the old buildings and foundations to the City of Grass Valley in July 1961. A museum of mineral and rock specimens, old mining equipment, and a picnic area are on the site, which is at the foot of Mill Street east of the freeway near the Empire Street overpass (map 1, location 18). **18**

Minor gold discoveries had been made in California—in Imperial County (1775-80), in San Diego County (1828), and in Los Angeles County (1835 and 1842). The news that gold had been found in the tailrace of Sutter's sawmill by James Wilson Marshall on January 24, 1848, was first printed in the March 15, 1848, issue of "The Californian" in San Francisco and lured thousands of gold seekers within a matter of months. Approximately 70 percent of the town of Coloma is included in Marshall Gold Discovery State Historic Park, including a working replica of the original sawmill. An historic museum on the site includes a pictorial exhibit of the gold discovery, and maps and relics, including a piece of timber from the first mill. The park also has 93 picnic tables, some of which are near the river. Coloma is northeast of Sacramento on Calif. 49, which connects with Interstate 80 at Auburn and U.S. 50 at Placerville (map 1, location 20). **20**

Columbia, like other Mother Lode towns, owes its existence to the gold rush, and like other towns, its population dwindled after the easily reached placer gold was gone. However, unlike many of the early communities, Columbia never became a ghost town, and through the years, it managed to retain much of its original appearance. Realizing that it had an opportunity to preserve a typical gold-rush town, the California Legislature in 1945 created Columbia State Historic Park. Columbia is different from most State parks in that the State's lands and buildings are scattered among private holdings and the streets are owned by the city. The State plan is to maintain Columbia as a living community, and concession contractors have been obtained to occupy the restored buildings. One of the first buildings to be restored originally housed the Wells Fargo & Co. express office. The huge gold scales on exhibit in the office have weighed out more than $55 million in gold dust and nuggets. Other restored buildings include a harness shop, restaurant, barber shop, candy shop, Chinese herb shop, newspaper office, carpenter shop, drugstore, and others. Columbia is being restored as nearly as possible to its appearance in its heyday, the 1850 to 1870 period. Columbia State Historic Park is on Calif. 49, 4 miles north of Sonora in Tuolumne County (map 1, location 21). It is open daily to the public. **21**

Established in 1848, San Andreas is a picturesque mining town with the original narrow, winding streets and old-style buildings. The Calaveras County Museum, on Main Street, contains a good display of minerals and gems and relics, papers, and documents connected with the early history of this mining town and county. It is open Monday, Wednesday, and Friday from 10:00 a.m. to 5:00 p.m., Tuesday and Thursday from 1:00 p.m. to 9:00 p.m., and Saturday from 1:00 p.m. to 4:00 p.m. Admission is free. San Andreas is on Calif. 49, 16 miles south of Jackson and 13 miles north of Angels Camp (map 1, location 33). **33**

Mark Twain stayed in Angels Camp while writing his famous short story, "The Celebrated Jumping Frog of Calaveras County." Angels Camp Museum, on Calif. 49 two blocks north of Angels Creek, contains a large variety of equipment used during the Gold Rush days (map 1, location 34). **34** It is a privately owned and operated museum with a small admission fee.

Closely associated with gold rush travel and discoveries, Jackson, on Calif. 49, is of interest for the antiquated galleried buildings along narrow streets—many of them reconstructed after a fire in 1862—and for lode mine hoists of numerous mines seen north and northwest of town (map 1, location 35). **35** The large quartz gold mines surrounding Jackson were the most important factor in Jackson's economy for many decades. Two of the most important mines, the Argonaut and Kennedy, lie directly north and west of town and can be seen from Calif. 49. The Kennedy mine was worked largely through vertical shafts to a vertical depth of 5,912 feet, making it the deepest mine in the United States. There were also about 150 miles of underground workings. The Argonaut mine, easily recognized from Jackson and Calif. 49 by its lofty water tank, was opened in 1850 and operated continuously between 1893 and 1942. The headframe over the shaft and the mine office building remain. Its most famous features are the huge tailings wheels, 68 feet in diameter, each with 176 buckets, built in 1902. These wheels lifted the wastes from gold milling operations over the hill into the next valley where they were impounded. The two remaining wheels, of the four original wheels, can be seen from Calif. 49 or visitors can drive from Jackson out Jackson Gate Road and walk up a short trail to get a closer view.

Another attraction in Jackson is the Amador County Museum at 80 Church Street. It is open daily except Tuesday from noon to 4:00 p.m. Admission is free.

First discovery of gold in Tuolumne County was
36 made in 1848 on Wood's Creek at Jamestown, 4 miles south of Sonoma on Calif. 49 (map 1, location 36). In the following 10 years, over $40 million in gold was taken from rivers, creeks, and gulches near Sonora. Tuolumne County Museum, in Memorial Hall on Washington Street, Sonora, contains items from the gold rush era. The museum is open Monday through Friday 8:00 a.m. to noon and 1:00 p.m. to 5:00 p.m. Admission is free.

Calif. 70.—Plumas-Eureka State Park, established in 1959, is well known for its glacier-carved granite peaks that rise above the forests of ponderosa, Jeffrey, and sugar pine, red and white fir, Douglas fir, and incense cedar interspersed with alder, black cottonwood, aspen, and willow along the stream beds, and with brushy areas of manzanita, chinquapin, ceanothus, and buckthorn. Popular in the summer for sightseeing, camping, hiking, and fishing, the park has lots of snow and cold weather in the winter. However, the park, its headquarters, and its historical museum remain open throughout the year. Hard rock gold mining was the primary activity in this region from 1851 until 1890; mining continued on a lesser scale, with occasional periods of excitement, until 1943. The historic town of Johnsville and the partially restored stamp mill of the Plumas-Eureka Mining Co. are within the park boundary. In the 1870's and 1880's, three tramways were built to bring ore to a central mill near Johnsville, and 400 men worked in the mines and mills. Plumas-Eureka State Park is west of the junction
22 of Calif. 70 and Calif. 89 near Blairsden, on a county road (map 1, location 22).

Calif. 79.—Gold was discovered in 1870 in the Julian mining district, and within a short time, more than 1,000 miners had come to the area in and around what is now the Cuyamaca Rancho State Park. To
23 reach the park, travel east on U.S. 8 from San Diego and turn north on Calif. 79 (map 2, location 23). The Stonewall mine is near the south shore of Cuyamaca Reservoir. The main shaft of the mine reached a depth of 630 feet, and the mine yielded more than $2 million worth of gold before it closed in 1892. Other attractions include an Indian exhibit and natural science displays in the Nature Den, hiking, and in the winter, limited snow sports. Family picnic facilities and campsites are provided.

U.S. 80.—Although gold reportedly was discovered along the Colorado River as early as 1862, major development began about 1880. In 1890, a large stamp mill was built near the river at Picacho and the Picacho mine began operating. Ore was hauled to the mill over a narrow-gage railroad. In 1904, Picacho had a population of 2,500, and 700 men were employed in the mine and mill. Total production of gold was valued

at $14 million. South of the campground and headquarters of the Picacho State Park Recreation Area, the ruins of the mill buildings can still be seen, but the old townsite of Picacho is under water. The park is 24 miles from Winterhaven. The first 6 miles of the road is paved; the last 18 miles is over a rough dirt road accessible to automobiles and small trailers. Winterhaven is on U.S. 80 near Yuma, Ariz., and just north of the Mexican border (map 2, location 24). **24**

Interstate 8.—The Tumco mine, a once-rich abandoned gold mine with many old structures still remaining, can be reached from Interstate 8, 34.5 miles east of El Centro. Turn north at marker sign and continue 6 miles to Ogilby, thence northwesterly along the Southern Pacific Railroad tracks to the Cargo Muchacho Mountains (map 2, location 25). **25**

Calif. 190.—Borax was mined from the floor of Death Valley (now a National Monument) from 1883 to 1889. During this time, more than 20 million pounds of borax was transported over the steep Panamint Mountains and across the desert to the railroad by teams of 20 mules traveling 15 to 18 miles per day hauling high-wheeled wagons with wooden beds. Using "20 Mule Team" as a trademark, Pacific Coast Borax Co. and later, its successor, U.S. Borax Co. converted borax from a virtually unknown compound to a household staple. Visitors to Death Valley—a trip best made in the winter to avoid the average summer daytime temperatures that range from 105° to 116° F—should first stop at the Borax Museum at Furnace Creek Ranch for orientation and then inspect the 20-mule-team wagons, samples of boron minerals, and mining equipment. Ruins of the Harmony Borax works, the Eagle Borax works, and the inactive borax works at Ryan are all within the boundaries of Death Valley National Monument. Also within the boundaries of Death Valley National Monument are the ghost towns of Skidoo, once a town of 700 residents where now only the tunnels and shafts of a rich gold-bearing area remain, and Leadfield, where a few buildings still stand. Death Valley National Monument may be reached by several routes. From Baker, Calif., on Interstate 15, travel north on Calif. 127 to Death Valley Junction, thence westerly on Calif. 19 to Furnace Creek. From U.S. Calif. 95, turn southwesterly at Lathrop Wells on Nev. 29, which becomes Calif. 127, and northwesterly on Calif. 190 to Furnace Creek. From U.S. 395, take Calif. 136 easterly from Lone Pine or Calif. 190 easterly from Olancha (map 2, location 26). **26**

Interstate 15.—Calico, named after the varicolored surrounding mountains, was a booming silver town of more than 3,500 people between 1881 and 1896. During that period, mining activities produced over $86 million in silver. In 1895, the price of silver dropped from $1.31 to $0.63 per ounce, the mines quit producing, and the town soon fell into ruin. The entire town was purchased in 1951 by Walter Knott of Knott's Berry Farm, Buena Park, Calif., and restoration was begun. In 1966, the town was donated to San Bernardino County and is operated by the County Regional Parks Department, which provides interpretive tours through the town. Concessions are operated in some of the restored buildings. Maggie mine, the bottle house, Hank's Hotel, the schoolhouse, old store, miners' shacks, and Boot Hill Cemetery are among the attractions. Calico is open from 9:00 a.m. to 5:00 p.m. daily, September 15 to June 1, and from 8:00 a.m. to 6:00 p.m. daily the rest of the year except December 25. Admission to Calico is 50¢ per car. The campground is open 24 hours per day at $3 per night. To

27 reach Calico, turn off Interstate 15, 5 miles east of Barstow at Yermo, then drive 3 miles north and follow the signs to Calico (map 2, location 27).

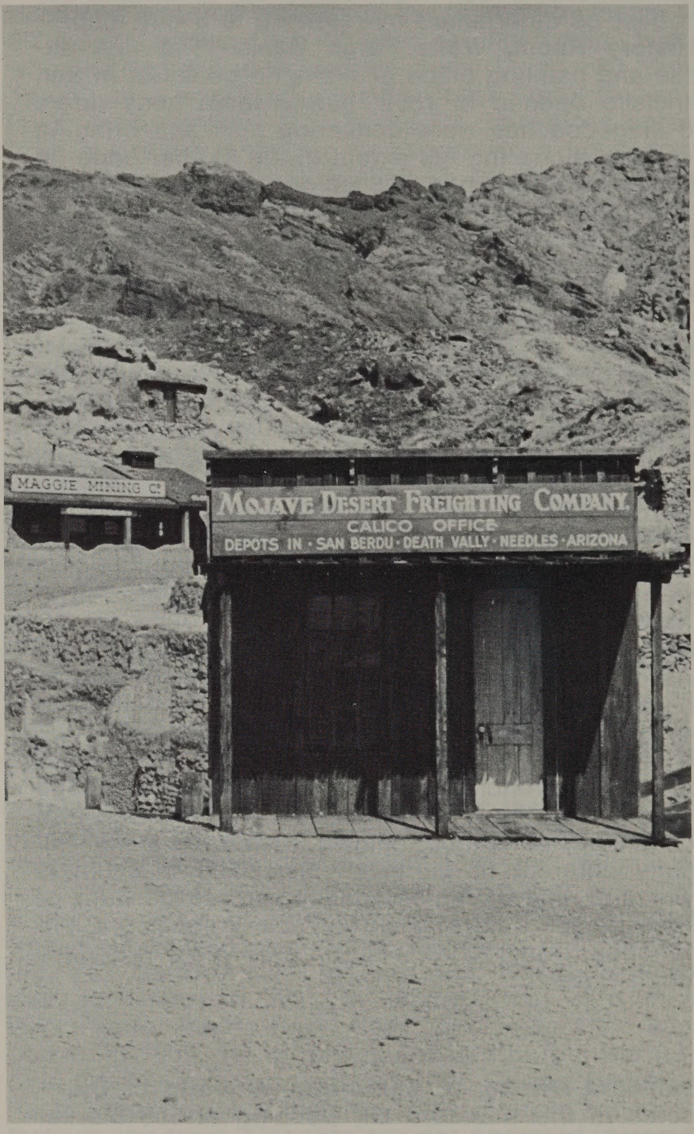
28 **San Francisco.**—Locations of mineral-related museum exhibits in San Francisco (map 1, location 28) can best be determined by referring to a city map.

History Room, Wells Fargo Bank.—The first express and banking office of Wells Fargo & Co. in San Francisco opened in 1852; before long, pony riders and stagecoaches were delivering mail and bringing back gold along the full extent of the Mother Lode. In 1880, Wells Fargo had 573 offices, agents, and correspondents, over 100 of which were in the gold country. The History Room collection of mementos covers the period from the discovery of gold through the San Francisco fire and earthquake of April 1906. It is centered around an original Concord stagecoach at the main office of Wells Fargo, 420 Montgomery Street. Here in addition to the stagecoach are samples of placer gold, gold-quartz specimens, coins struck by private companies, and money from all over the world that circulated in San Francisco during the early days. The History Room is open to the public every banking day from 10:00 a.m. to 3:00 p.m. and by appointment during other business hours. Groups are invited but should make advance appointments by telephoning the Director, (415) 396-2648, or writing to Wells Fargo Bank, San Francisco, Calif. 94120.

Bank of California Gold and Coin Museum.—The Bank of California has an exhibit of gold specimens and western monies, including currencies and coinage from early days in Alaska, British Columbia, California, and Oregon, U.S. gold coins, and privately minted coins and currencies. There was a chronic shortage of coins in the early days of California, and assayers and banking companies minted their own coins—all slightly different in intrinsic value. The museum is downstairs near the safe-deposit vaults at the Bank of California, 400 California Street, San Francisco, Calif. It is open from 10:00 a.m. to 3:00 p.m., Mondays through Fridays.

Standard Oil Co. of California—A World of Oil.—Located in the Standard Oil Building at 555 Market Street, San Francisco, this museum presents an educational exhibit on the geology and production of petroleum. A continuous movie at the entrance shows the history of the earth and the formation of oil deposits. On display are large bits, reamers, and other tools used to drill for oil, dioramas illustrating the early use of petroleum products in the home, an early-day service station, and a bulk oil plant. The museum is open from 10:00 a.m. to 4:00 p.m. Monday through Fridays.

Division of Mines and Geology Museum.—In San Francisco, in the Ferry Building at the foot of Market Street, the California Division of Mines and Geology maintains an excellent mineral exhibit and a library.


MAGGIE MINING Co
MOJAVE DESERT FREIGHTING COMPANY
CALICO OFFICE
DEPOTS IN · SAN BERDU · DEATH VALLY · NEEDLES · ARIZONA

The offices of Maggie Mining Co. and the Mojave Desert Freighting Co. are two of the remaining structures in Calico Ghost Town, which is operated as a regional park by the County of San Bernardino, Calif.

The museum, founded in 1880, now has thousands of mineral, rock, and ore specimens, and Bay Area gem and mineral societies augment the display with interesting exhibits on a rotating basis. Replicas of the most famous gold nuggets ever found in the world and beautiful gold specimens from California mines are also on display. Tours for groups may be arranged in advance by calling (415) 557-0633. Hours are from 8:00 a.m. to 5:00 p.m. Mondays through Fridays and 10:00 a.m. to 12:00 noon the first Saturday each month (State and Federal holidays excepted).

The Old Mint.—The first mint building in San Francisco started receiving gold deposits on April 3, 1854, with just 60 square feet of floor space. Obviously too small, the mint was replaced by the structure at Fifth and Mission Streets in the summer of 1874. This building, which withstood the earthquake and fire of April 1906, has been designated as a National Historic Landmark. Since April 1973, it has housed the Bureau of the Mint's Special Coins and Medals sales activities. Museum rooms are being authentically restored to their 1874 appearance. The building is open to the public during business hours.

Los Angeles.—The La Brea Tar Pits, part of Hancock Park, are a Registered Natural History Monument of the National Park Service. The pits, operated by the Los Angeles County Museum of Natural History, occupy a city block bounded by Wilshire Boulevard on the south, Sixth Street on the north, Curson Avenue on the east, and Ogden Drive on the west. Parking is available, with entry on Curson Avenue. The pits were first reported as "springs of pitch" by the Spanish explorer Gaspar de Portola in 1769; a mixture of sticky, heavy asphalt and water continues to seep from underground deposits. The pits are the world's largest source of ice-age fossils. The pits have existed for about 40,000 years during which they were a death trap for a wide variety of wildlife, including mastodons, saber tooth cats, giant ground sloths, camels, bears, bison, dire wolves, huge condor-like vultures, and other birds. Skeletons of these animals are exhibited at the Museum of Natural History, 90 Exposition Boulevard. Most of the fossils were recovered from 1906 through 1915, but recently a dig was initiated at one of the pits using modern scientific techniques. This exploration will probe beyond the recorded 43-foot depth of known fossil deposits and will recover smaller fossils such as rodents, lizards, birds, and microfossils of seeds, pollen, and other organisms. Of special interest is an exposed mass of bone and asphalt that can be viewed from a special observation pit. As early as 1856, a company organized in San Francisco reportedly began working the La Brea Tar Pits and distilled some oil from the recovered asphalt **29** (map 2, location 29).

Interstate 5.—A collection of approximately 4,000 troy ounces of native gold nuggets take from nearby lode and placer mines during the Gold Rush are displayed in the foyer of the Siskiyou County Courthouse in Yreka. Also in Yreka, just south of the business district off Interstate 5, the Siskiyou County Museum contains a collection of minerals, gem stones, fossils, and rock specimens representative of all parts of the county (map 1, location 30). **30**

Calif. 99.—Bakersfield is the trading center for the southern San Joaquin Valley, which is rich in agriculture, oil, and minerals. The Kern County Museum and Pioneer Village, 3801 Chester Avenue, Bakersfield, Calif., (map 2, location 31) features, among other things, mineral and fossil exhibits, an old oil rig, and the history of oil production in the area. The museum is open Monday through Friday 8:00 a.m. to 5:00 p.m., and Saturday, Sunday, and holidays noon to 7:00 p.m. A small admission fee is charged. **31**

Calif. 198.—Coalinga is surrounded by producing oil wells. The Coalinga district, second largest oil producing area in the State, has been a major producer since 1896. Important fossils beds lie both north and south of town. The R. C. Baker Memorial Museum, 297 W. Elm Street, Coalinga, displays fossils, Indian artifacts, oilfield equipment and various local mementos (map 2, location 32). R. C. Baker, the benefactor of the museum, was an inventor and supplier of specialized oil drilling tools. The museum is open Monday through Friday 9:00 a.m. to 5:00 p.m., Saturday from 11:00 a.m., and Sunday from noon; admission is free. **32**

FOR MORE INFORMATION WRITE OR VISIT

Federal Bureau of Mines Liaison Office, 650 Capitol Mall, Sacramento, Calif. 95814

California Division of Mines and Geology, 1416 Ninth Street, Sacramento, Calif. 95814; Ferry Building, San Francisco, Calif. 94111; and 107 South Broadway, Los Angeles, Calif. 90012.

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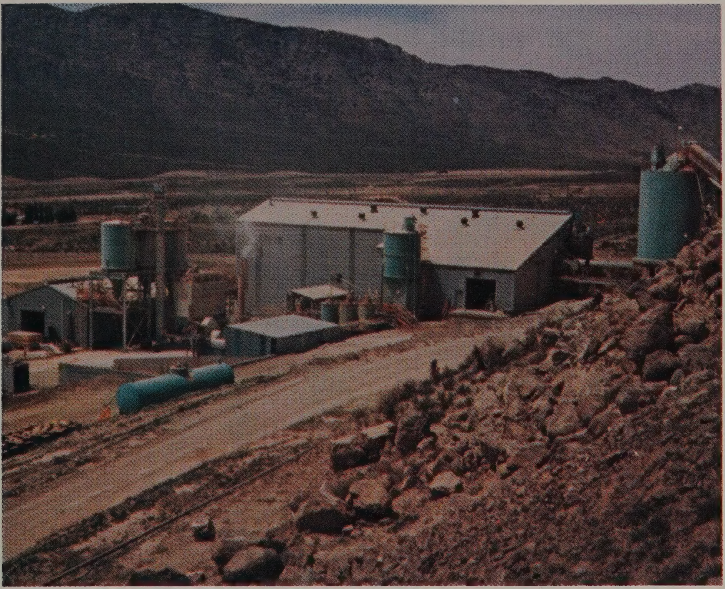


Flotation concentration plant at Mountain Pass operation.

Ghost town at Randsburg, Calif.

HAWAII

by

Donald Irving and William H. Kerns

Virtually all of Hawaii's mineral output is used for construction materials—stone, cement, sand and gravel, pumice, and lime. The mining operations are small and use standard techniques that are commonplace throughout the world. Thus, they offer little to compete with other more interesting attractions for the attention of tourists to these colorful islands.

The Hawaiian Archipelago is a group of islands, reefs, and shoals about 1,600 miles long with the Hawaiian Islands, essentially basaltic volcanic domes, at the southern end. From May 1969 to July 1973, Kilauea Volcano on the Island of Hawaii, one of the world's most active volcanoes, has produced more than 440 million cubic yards of lava, buried 25 to 30 square miles of surrounding ranchland and forest, and on five occasions has cascaded rivers of lava over steep terraced cliffs and into the Pacific Ocean where it has added about 210 acres of new land to the Island of Hawaii. Visitors to the Hawaii Volcanoes National Park may have the opportunity to see this rock-making process (map location 1). **1**

Coral gardens and other marine life in its natural surroundings can be seen from tours that are available on a glass-bottom boat leaving from the Heeia Kea Pier at Kaneohe Bay, 3 miles north of Kaneohe Town on the Kamehameha Highway on the Island of Oahu (map location 2). **2**

Offshore at Makapuu Point, also on Oahu, divers use a two-man submarine, equipped with a claw device on the front and a basket device on the side, to harvest a beautiful light pink coral from a water depth of 1,200 feet (map location 3). **3** Visitors to that area may be fortunate enough to see the divers returning to shore with their catch.

Beds of black coral occur 150 to 250 feet below the surface in waters near Lahaina on the Island of Maui (map location 4). **4** The coral is harvested by scuba divers and used, along with the pink coral from Oahu, to produce bracelets, earrings, necklaces, cufflinks, and other jewelry items.

MINES AND PLANTS YOU CAN SEE FROM THE HIGHWAYS

OAHU

5 6 Small open pit mines yielding coral limestone are the Warren sand pit, 1.3 miles north of Haleiwa on the Kamehameha Highway, and the Waimanalo quarry, 0.25 mile southeast of the Waimanalo post office on the Kalanianole Highway (map locations 5–6).

KAUAI

7 Basalt is mined from the Bluestone quarry, a single-bench quarry 3 miles west of Puhi near Halfway Bridge on Hawaii 50, and coral limestone is dug from the Kawaiele sand pit, on the southwest side of Hawaii 50, 3.5 miles west of Kekaha in the same area (map location 7).

8 Near the Hanapepe shoreline, natives of Kauai annually produce a small quantity of coarse-grained salt by solar evaporation, using water from a series of wells that are fed by subterranean seawater (map location 8). The process and the salt pans, which are made of earth lined with clay, go back to prehistoric times, and the know-how of salt production is handed down from one generation to the next. Salt is made on hot, sunny days in the summer.

MOLOKAI

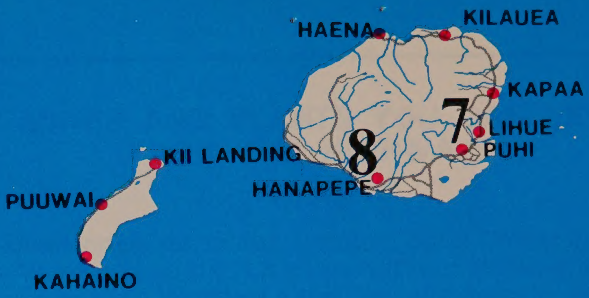
9 Basalt is mined from the sidehill Manawainui quarry, 3 miles south of Kualapuu, on Hawaii 46 (map location 9).

MAUI

10 Sand and gravel is recovered by bulldozer from an alluvial fan 3 miles south of Wailuku on Hawaii 30 (map location 10).

HAWAII

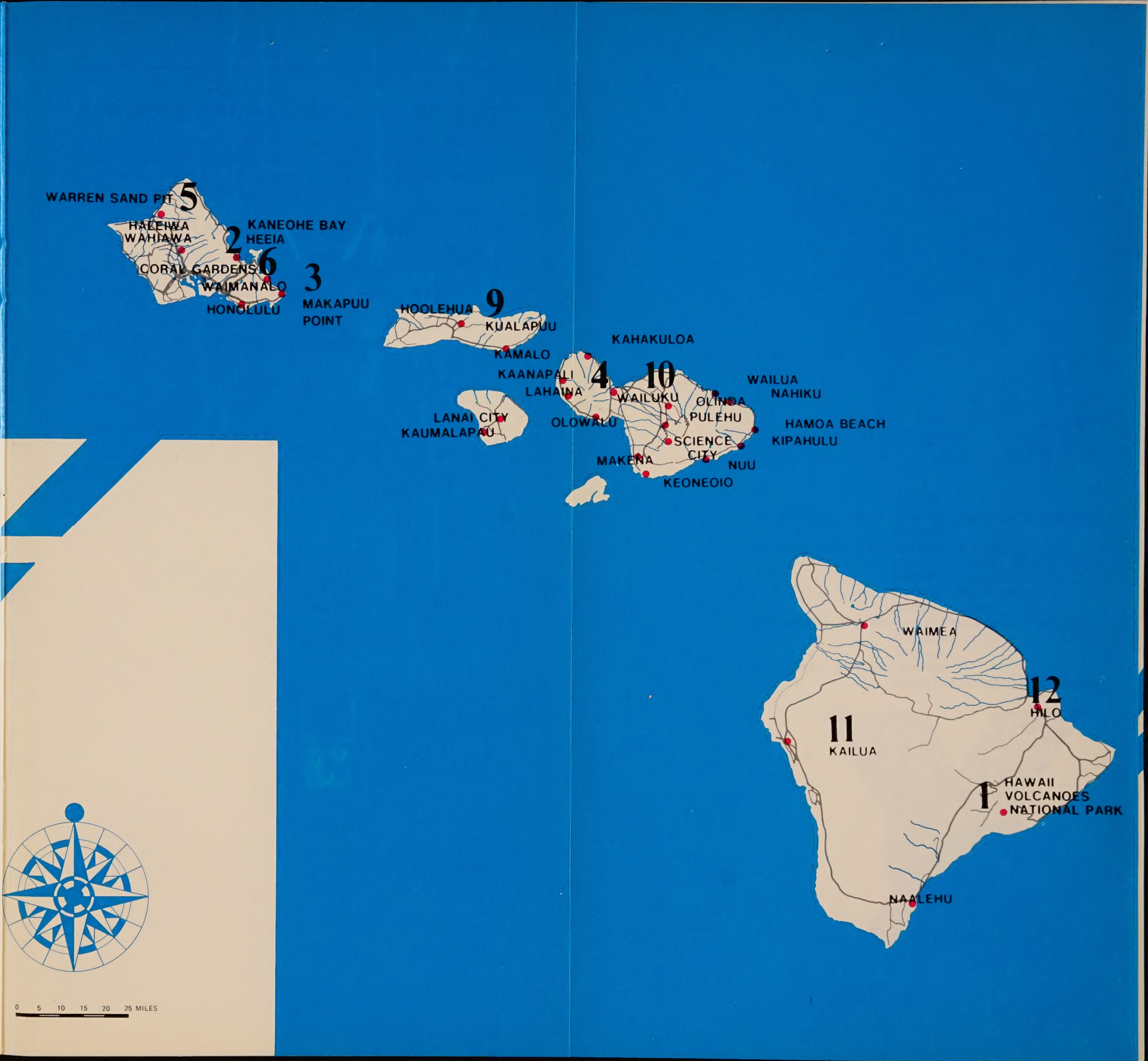
11 12 Basalt is mined from 30–foot–high single-bench quarries 3 miles north on Kailua on the Kona airport road and 3 miles south of Hilo on Leilani Lane (map locations 11–12).


HAENA
KILAUEA
KAPAA
7
LIHUE
PUHI
KII LANDING
8
HANAPEPE
PUUWAI
KAHAINO

LEGEND

1—RECENT LAVA DEPOSITS
2—CORAL DEPOSITS
3—PINK CORAL DEPOSITS
4—BLACK CORAL MINING
5—OPEN PIT CORAL MINE
6—OPEN PIT CORAL MINE
7—BLUESTONE (BASALT) QUARRY
8—HANAPEPE NATIVE SALT PRODUCTION FACILITIES
9—MANAWAINUI BASALT QUARRY
10—SAND AND GRAVEL PIT
11—BASALT QUARRY
12—BASALT QUARRY

TERRITORY OF HAWAII
1900


WARREN SAND PIT
5
HALEIWA
WAHIAWA
KANEOHE BAY
HEEIA
2
CORAL GARDENS
6
WAIMANALO
3
HONOLULU
MAKAPUU
POINT
HOOLEHUA
9
KUALAPUU
KAMALO
KAHAKULOA
KAANAPALI
4
10
LAHAINA
WAILUKU
WAILUA
NAHIKU
OLINDA
LANAI CITY
KAUMALAPAU
OLOWALU
PULEHU
HAMOA BEACH
SCIENCE
CITY
KIPAHULU
MAKENA
NUU
KEONEOIO
WAIMEA
12
HILO
11
KAILUA
1
HAWAII
VOLCANOES
NATIONAL PARK
NAALEHU
0 5 10 15 20 25 MILES

FOR MORE INFORMATION WRITE OR VISIT

Federal Bureau of Mines Liaison Office, 650 Capitol Mall, Room 3046, Sacramento, Calif. 95814.

Hawaii Division of Water and Land Development, P.O. Box 373, Honolulu, Hawaii 96809.

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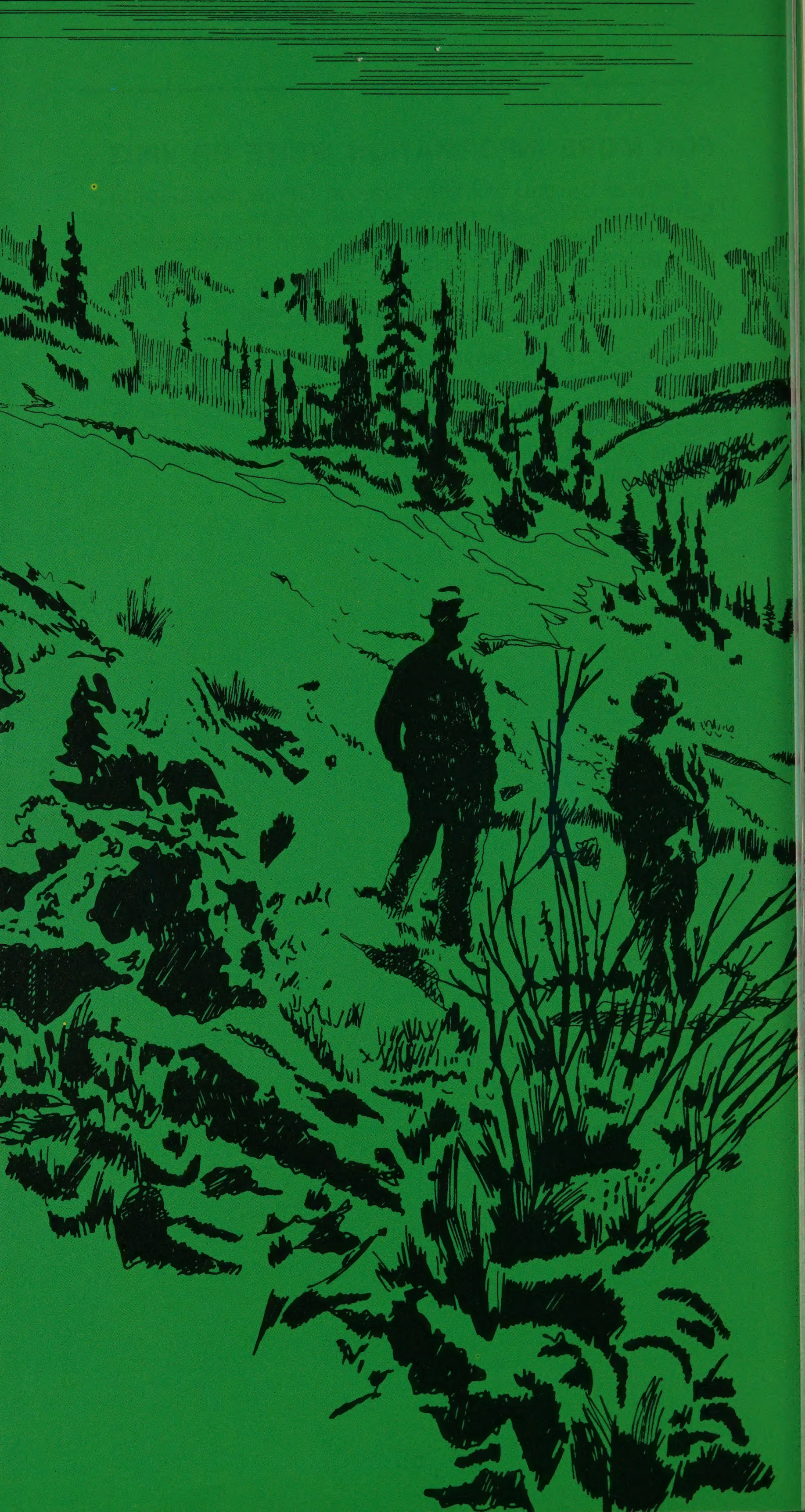
Hawaii. The Sunset Magazine. Lane Magazine & Book Co., Menlo Park, Calif., 1965.

The Mineral Industry of Hawaii. Ch. in Bureau of Mines Minerals Yearbook, v. 2 (Annual).



OREGON

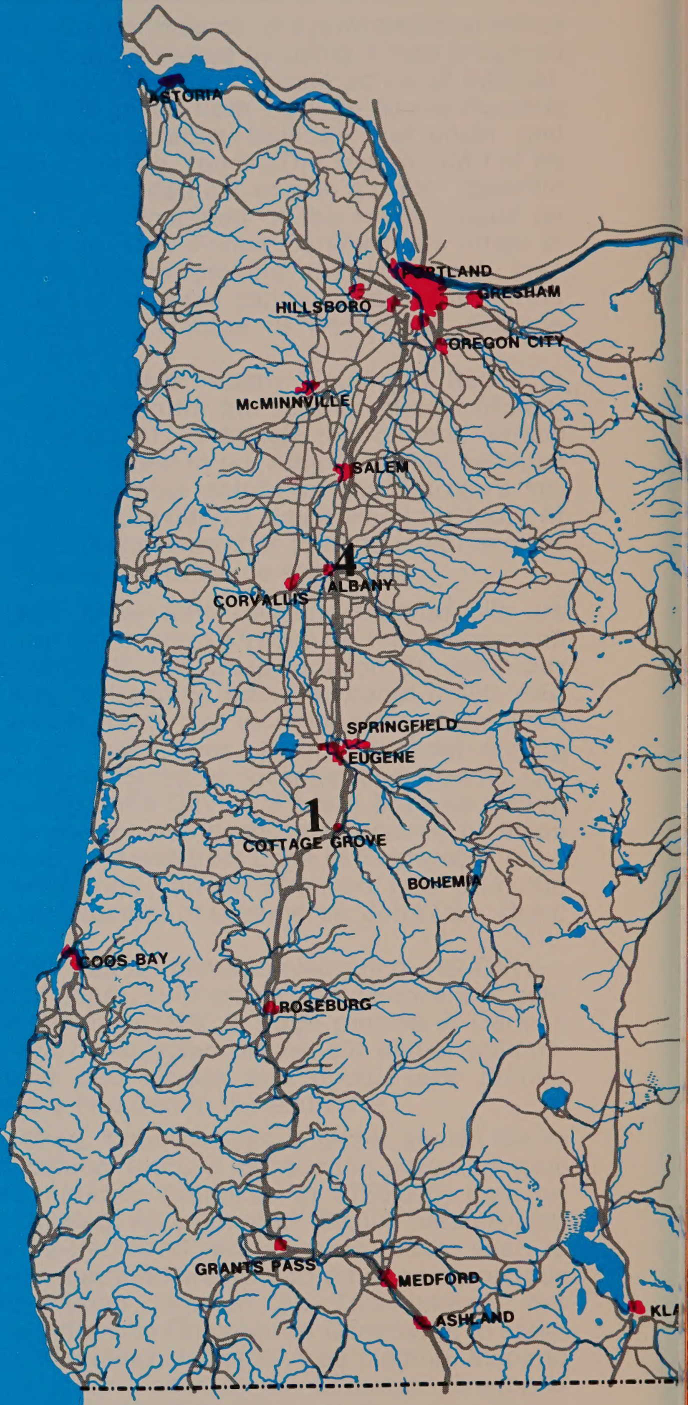
by
Walter E. Lewis

Oregon's mineral industry began soon after the discovery of gold in California. By 1850, prospectors had moved north and discovered gold in southwestern Oregon. The second major discovery was in 1861 when placer gold deposits were discovered in northeastern Oregon near Baker. Although gold was the dominant mineral produced in the earlier years, its production value was far exceeded by the rapid growth in value of stone and sand and gravel starting in about 1935. This growth in sand and gravel production was tied directly to the installation of hydroelectric projects on the Columbia and other rivers and industrial growth related to cheap hydroelectric power. Nickel mining began at Riddle in 1954, and today nickel is the second largest valued crude mineral mined in the State.

Semiprecious gem stones found in Oregon provide the basis for recreation for countless State residents and tourists. The value of recreational mining by hobbyists in Oregon exceeds that of any other State. Most of the semiprecious stones found in the State are quartz gems, the most famous being the thunder egg. In 1965, it was declared Oregon's official State rock by an act of the legislature. Thunder eggs are agate nodules and physically are small spheroidal bodies 1½ to 3 or more inches in diameter.

MINES AND PLANTS YOU CAN SEE FROM THE HIGHWAYS

Interstate 5.—The Bohemia gold mining district has been promoted as a tourist attraction. Cottage Grove, located in west-central Oregon on Interstate 5, is the central point for information (map location 1). It has an annual celebration (Bohemia Days—third weekend each July) that is built around the mining theme, including bus tours to the Bohemia district and gold panning exhibitions. The Bohemia mining district is located 36 miles southeast of Cottage Grove, and excursions to the district are offered by a firm in Cottage Grove. One of the tours includes a visit to a gold mine currently under development. 1


ASTORIA
PORTLAND
GRESHAM
HILLSBORO
OREGON CITY
McMINNVILLE
SALEM
4
ALBANY
CORVALLIS
SPRINGFIELD
EUGENE
1
COTTAGE GROVE
BOHEMIA
COOS BAY
ROSEBURG
GRANTS PASS
MEDFORD
ASHLAND
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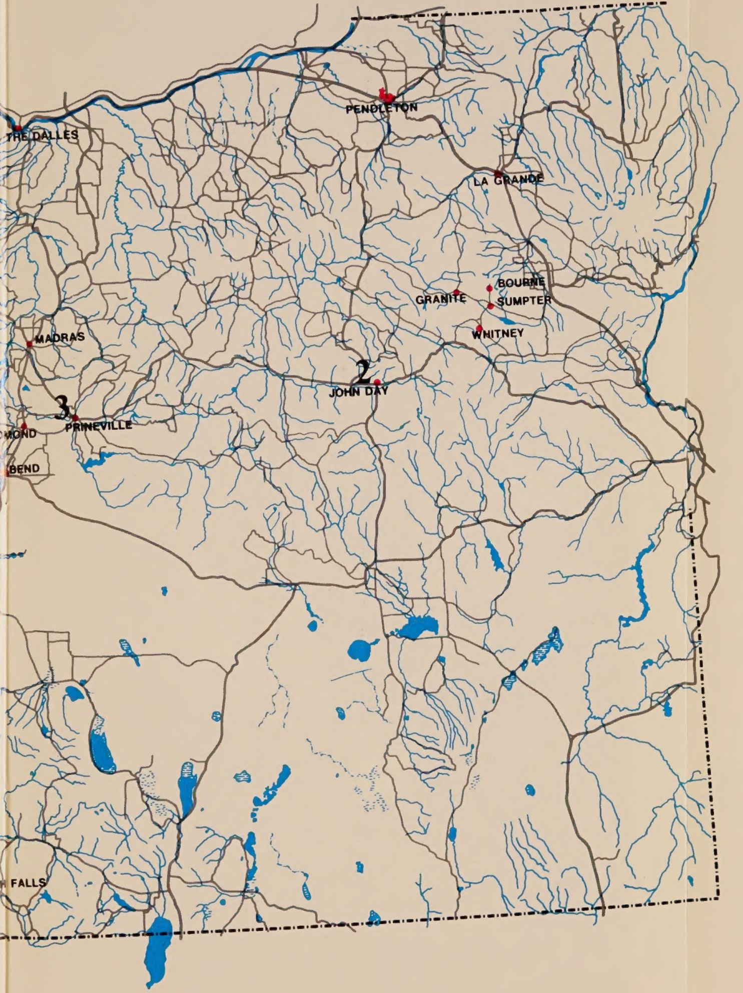
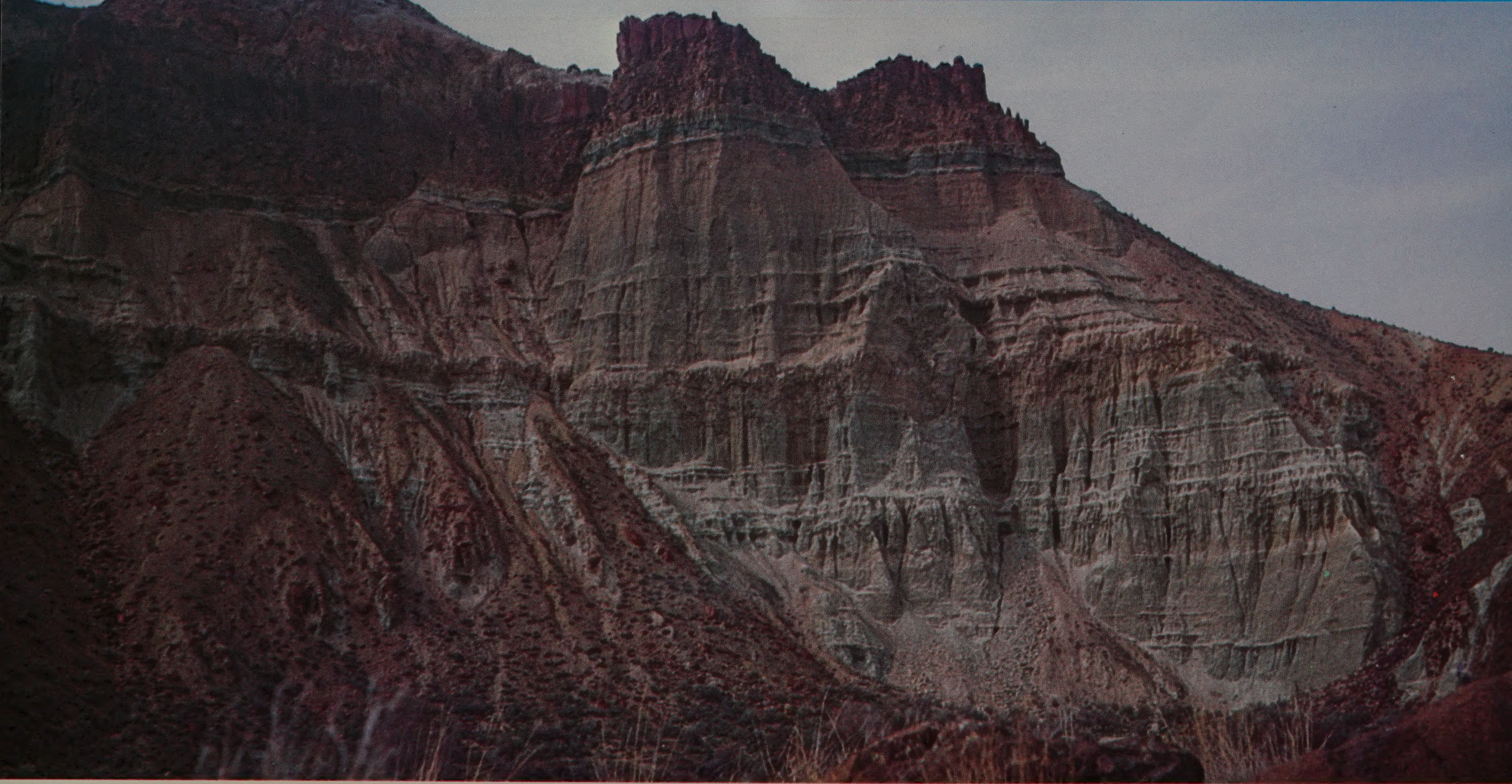

PENDLETON
THE DALLES
LA GRANDE
BOURNE
GRANITE
SUMPTER
WHITNEY
MADRAS
2
JOHN DAY
3
PRINEVILLE
MOND
BEND
FALLS
0 5 10 15 MILES

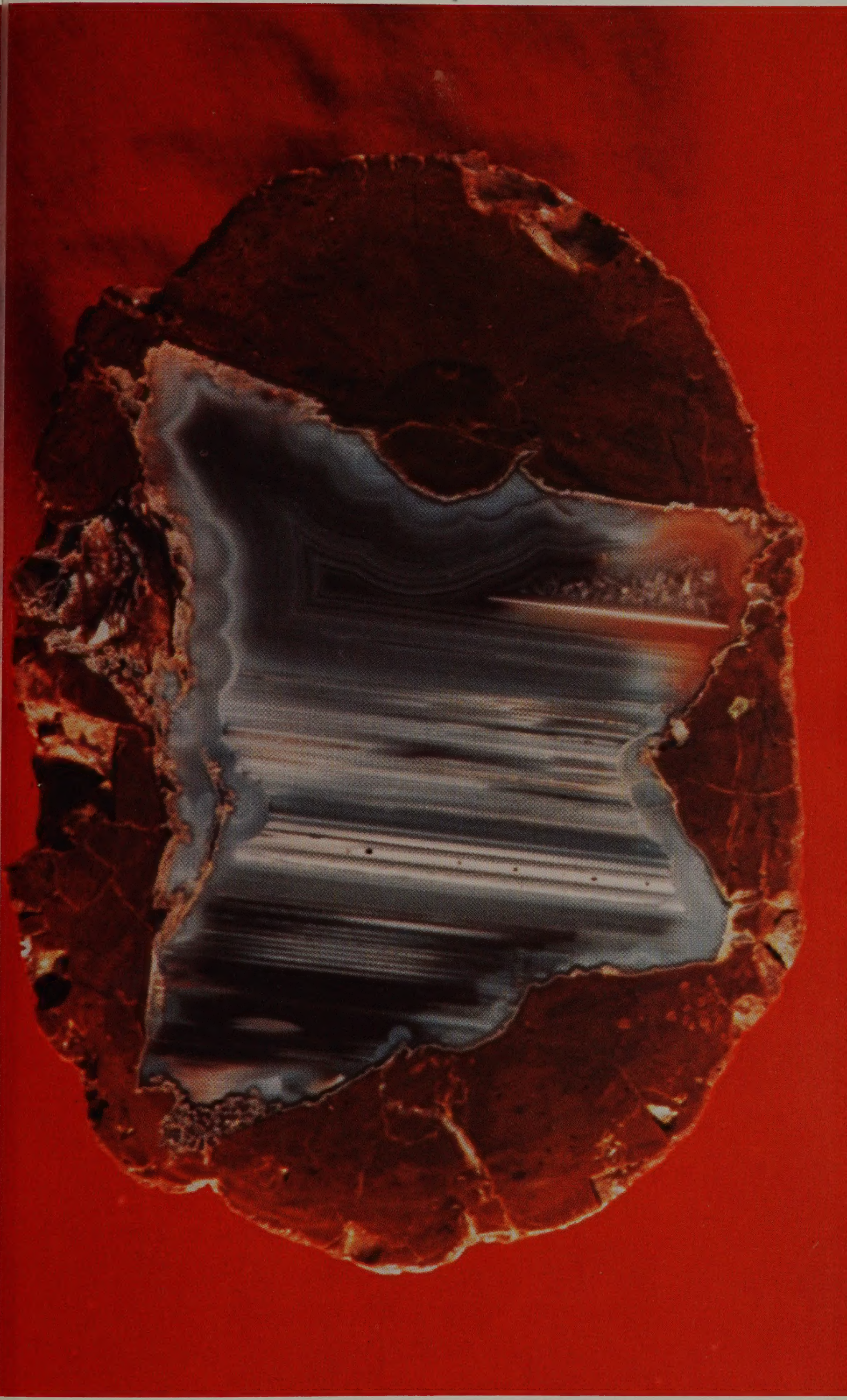
LEGEND

1— COTTAGE GROVE: BOHEMIA GOLD MINING DISTRICT
BOHEMIA
2— JOHN DAY: OLD GOLD MINING DISTRICT
WHITNEY - GHOST TOWN
SUMPTER - GHOST TOWN
GRANITE - GHOST TOWN
BOURNE - GHOST TOWN
3— PRINEVILLE: SEMIPRECIOUS GEM STONE DEPOSITS
REDMOND
MADRAS
4— ALBANY: BUREAU OF MINES
METALLURGY RESEARCH CENTER

Hanna nickel mine and smelter near Riddle, Oreg., which is the only nickel mine in the United States. (Courtesy of State of Oregon Department of Geology and Mineral Industries.)



John Day fossil beds north of Kimberly, Oreg. (Courtesy of Oregon Department of Geology and Mineral Industries.)



Petrified wood thunder egg, Oregon. (Courtesy of Lloyd Staples, Department of Geology, University of Oregon.)

Oregon Portland Cement Co. plant at Lime, Oreg. (Courtesy of Oregon Department of Geology and Mineral Industries.)

cluding search for gem stones, geology lectures, special rock displays, and sawing rock.

FOR MORE INFORMATION WRITE OR VISIT

Department of Geology and Mineral Industries, 1069 State Office Bldg., Portland, Oreg. 97201.

Prineville Chamber of Commerce, Prineville, Oreg. 97754.

Cottage Grove Chamber of Commerce, Cottage Grove, Oreg. 97424.

Grant County Chamber of Commerce, John Day, Oreg. 97845.

Federal Bureau of Mines Liaison Office, Suite 7, Standard Insurance Bldg., 475 Cottage St. NE, Salem, Oreg. 97301.

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The following publications may be obtained from the State of Oregon, Department of Geology and Mineral Industries, 1069 State Office Building, Portland, Oreg. 97201:

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Field Guidebook, Geologic Trips Along Oregon Highways, Bulletin 50, W. D. Wilkinson, 1959, 148 pp.

The Gem Minerals of Oregon, Bulletin 7, H. C. Drake, 1938, 16 pp.

Gold and Silver in Oregon, Bulletin 61, Howard C. Brooks and Len Ramp, 1968, 337 pp.

Origin and History of the Thunder Egg, Lloyd W. Staples. Ore Bin, v. 27, No. 10, pp. 195–204.

WASHINGTON

by
Hal J. Kelly

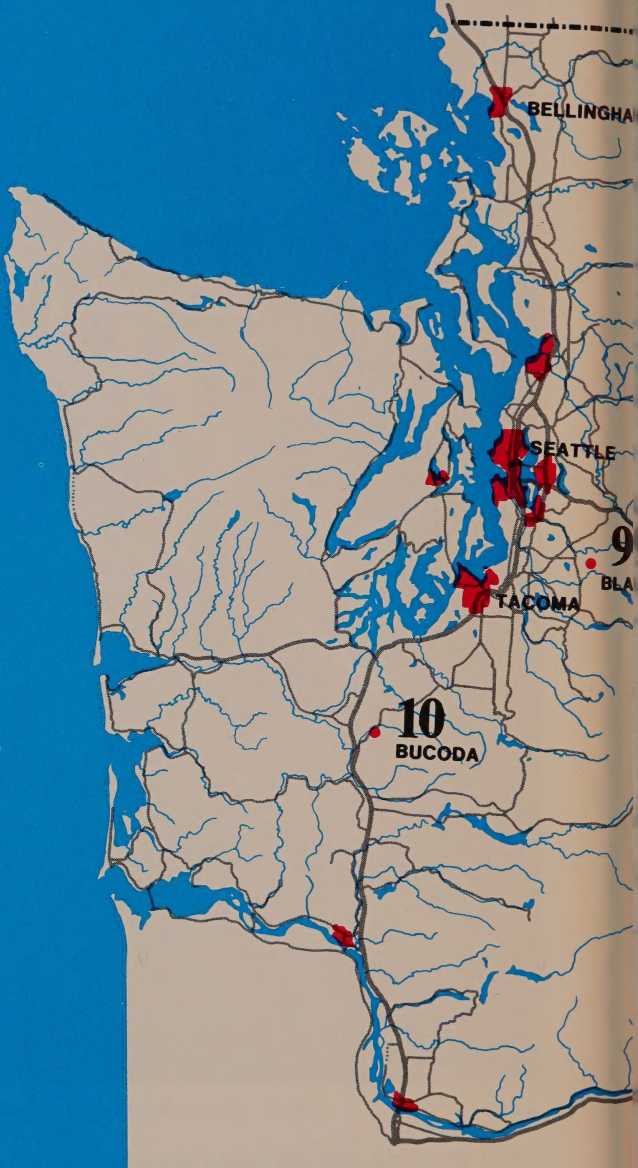
Washington's mineral production through history has been as diverse as the topographic and geologic settings in which its mineral wealth is found. Gold and coal were the important early-day mineral products; the emphasis changed with time to lead, zinc, silver, and copper, and finally to uranium. Although gold was discovered in the State as early as 1853, only sporadic mining of placer deposits occurred until about 1900. At that time, most of the placer resources were exhausted. The early day of mining lode gold dated from the 1870's until the present time. The most continuous mining history has been that of the Republic district. Other prominent gold mining districts are the Railroad Creek, Blewett Pass, Mount Baker, Monte Cristo, Slate Creek, Oroville-Nighthawk, Orient, and Wenatchee areas. Lead and zinc production has been from the counties of Okanogan, Pend Oreille, and Stevens. Early production was not spectacular, but in the period of 1930's to the present time, lead and zinc production have been an important part of the State's mineral production. Copper mining was carried on in Snohomish and Stevens Counties, but the greatest single source was the Holden copper mine about 12 miles west of Lucerne, which is on the shore of Lake Chelan. The mine was a major producer from 1938 to 1955. Although early-day copper mining was an important industry in Snohomish County, the northwestern part of the State still has large low-grade deposits that eventually will become important resources of this metal. Presently, the only operating uranium mine in the State is the Midnite, located northwest of Spokane, but potential resources are known on the Spokane Indian reservation near the Midnite mine. The metallic mines of the State were spread from east to west across the mountainous northern half of the State; nonmetallic resources are largely in the western portion. However, northeastern Washington embraces the entire gamut of currently operating, dormant, and abandoned mines.

MINES YOU CAN SEE FROM THE HIGHWAYS

Wash. 25.—A loop trip from Colville, which is 75 miles north of Spokane via U.S. 395, plunges the tourist into mountainous country interspersed by alpine meadows and crystal-clear fishing streams (map

Decaying mill building north of Bossburg, Wash.

1 location 1). The loop trip is all on hard-surfaced, two-lane, traffic-free roads from which one may observe at close hand distant past, recent past, and currently active mines. A short drive from Colville to


BELLINGHA
SEATTLE
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BLA
TACOMA
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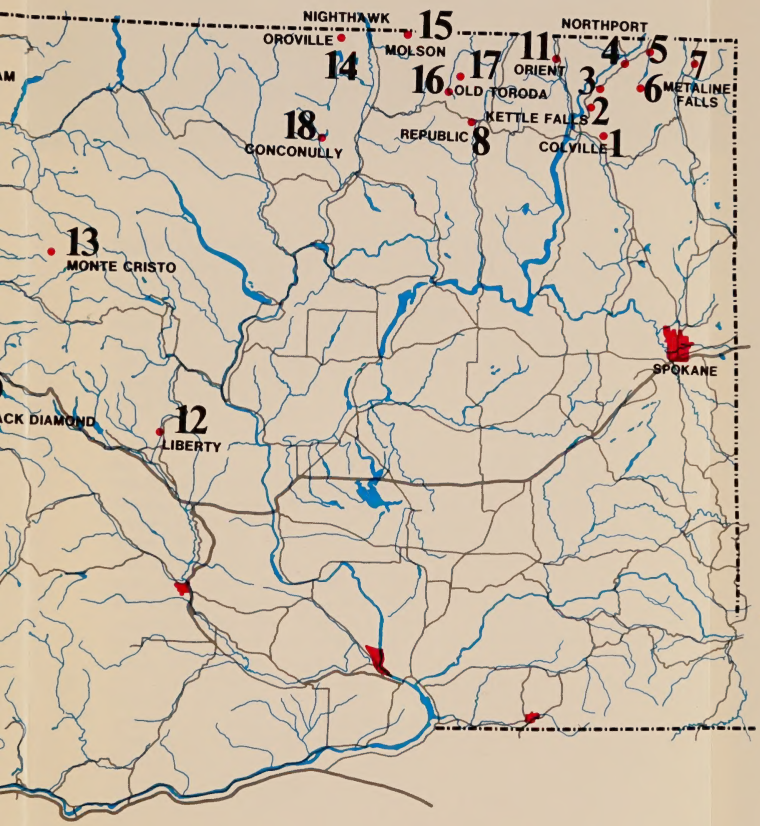
BUCODA


NIGHTHAWK
OROVILLE
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MOLSON
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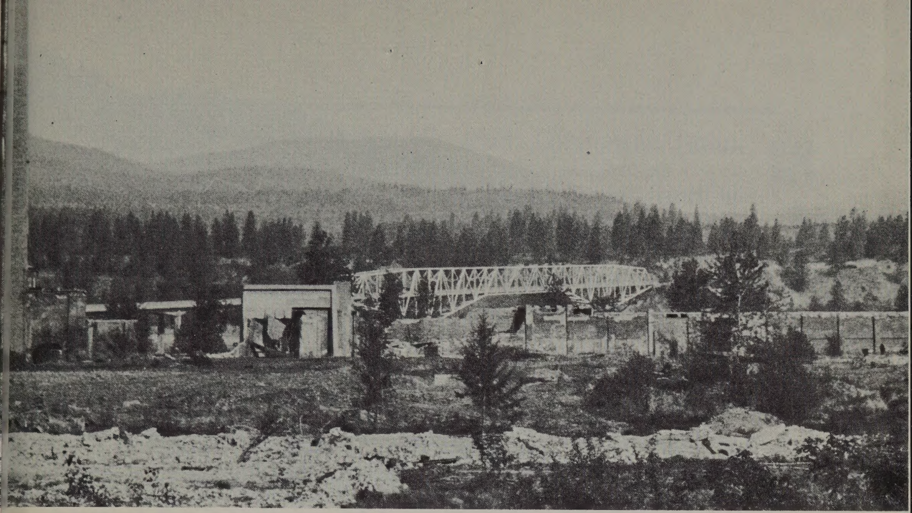
17
OLD TORODA
11
ORIENT
NORTHPORT
4
5
7
3
6
METALINE
FALLS
2
KETTLE FALLS
18
CONCONULLY
REPUBLIC
8
COLVILLE
1
AM
13
MONTE CRISTO
SPOKANE
ACK DIAMOND
12
LIBERTY

0 10 20 30 MILES

LEGEND

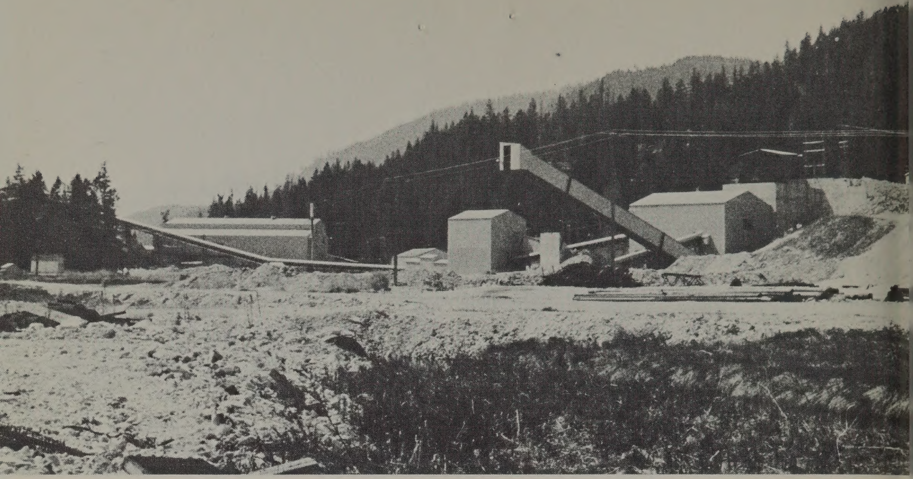
1– GATEWAY TO OLD MINING DISTRICT
2– EVAN: PIONEER MINING TOWN
3– BOSSBURG: PIONEER MINING TOWN
4– SMELTER RUINS
5– CALHOUN LEAD-ZINC MINE (INACTIVE)
6– SIERRA ZINC MINE
7– LEAD-ZINC MINING AREA
8– GOLD MINE (INACTIVE)
9– EARLY-DAY COAL MINING
10– CENTRALIA COAL STRIP MINE
11– OLD GOLD MINING DISTRICT
12– PLACER GOLD DEPOSITS
13– EARLY-DAY GOLD MINING DISTRICT
14– EARLY-DAY GOLD MINING DISTRICT
15– EARLY-DAY GOLD MINING DISTRICT
16– EARLY-DAY GOLD MINING DISTRICT
17– EARLY-DAY GOLD MINING DISTRICT
18– EARLY-DAY GOLD MINING DISTRICT

THE SEAL OF THE STATE OF WASHINGTON
1889



Remains of smelter at Northport, Wash.

Kettle Falls brings the visitor to the spectacular Columbia
River, which may be followed via Wash. 25 to
Evans and Bossburg, nearly vanished pioneer mining
towns, past abandoned mines and mill buildings to **2**
Northport, site of a historic smelter (map locations
2–4). The smelter ruins, now intermingled with an **4**
active sawmill, stand as an imposing relic of the past.
Similarly, many brick business buildings, both occupied
and abandoned, reflect the architectural style of
the late 1800's. Although none of the buildings are
being restored, many have colorful histories but none
so colorful as a huge dilapidated frame structure—
the town brothel. From Northport, the loop trip continues
eastward on the Deep Creek road to Spirit
junction where the Deep Creek and Aladdin roads
meet. Between Northport and Spirit junction, many
old mines are located along the highway, and others
can be seen on distant hills by the sharp-eyed
observer. A short excursion north, past Deep Lake to
Leadpoint to the Calhoun property, will give the
tourist a view of a dormant mine of considerable size
(map location 5). Local inquiry will locate other mining **5**
properties in the area. Traveling south toward
Aladdin, one may see other properties along the road,
and to the west, the refurbished mill at the Sierra
zinc mine contrasts with the green tapestry of the
forest (map location 6). Continuing southward, the **6**
traveler completes the loop by returning to Colville.
The mining museum in Colville is well worth the visitor's
time. By additional excursions northeast to Metaline
Falls or west to Republic, an operating lead-zinc
mine and an active gold mine may be seen. The town
of Metaline Falls is located on the eastern edge of a
historic lead and zinc mining area that has been in
continuous production for the past 25 years (map
location 7). Initial production began in this area in **7**
1906, but it was insignificant until about 1929. However-



Dormant Calhoun mine at Leadpoint, Wash.

ever, by 1965, mining had declined. Because of the fairly recent history of mining in the area, many mines and ancillary facilities are visible from the highways.

8 **Wash. 20.**—A trip to Republic by traveling westward from Colville will reward the tourist with relatively wild mountain scenery and a stimulating experience in the mining town, a center of gold production throughout Washington's history (map location 8). Knob Hill, an operating gold mine about 2½ miles northwest of town, is visible from the road. A pioneer days celebration is held there each year early in June. Continuing westward brings the tourist to Tonasket, an apple-raising center, thence south to Okanogan on U.S. 97 where North Cascades Highway terminates. From Okanogan, one may travel about 30 miles northward to the historic gold and silver mining town of Conconully or continue on Wash. 20 to Winthrop. Conconully may be reached from either Twisp or from

Mill building at the Sierra zinc property, near Colville, Wash.

Winthrop, but the best road is from Okanogan (map location 18). **18**

Winthrop is a rejuvenated "western town" and is the true portal of the spectacularly beautiful North Cascades Highways. This new highway traverses the rugged Cascade Mountains to Ross Lake and other manmade lakes, which are the hydroelectric generating centers for Seattle City Light. The craggy, roughhewn mountain country on either side of the highway is the locale of many early-day mining ventures. Mazama and the Harts Pass area roads lead to many oldtime mining operations. To travel beyond Harts Pass, which is about 20 miles from Mazama, will require a rugged vehicle. The condition of the road beyond the pass should be determined before plans are made to go beyond the summit.

The Knob Hill gold and silver mine near Republic, Wash.

On completion of the North Cascades trip to Marblemount, it is only a short drive to Interstate 5, the major north-south freeway, south to Seattle, or north to the Canadian border.

Wash. 530.—The old mining center of Monte Cristo can be reached from Wash. 530 from Arlington to Oso, Darrington, and Monte Cristo (map location 13). **13** This area embraces a historic copper and gold mining belt that supported the long-vanished Parrott smelter at Everett. Several mining properties are within walking distance of Monte Cristo.

Wash. 169.—Traveling by this highway south of Renton, one may see the locale of early-day coal mining in Black Diamond, Cumberland, Palmer, and Ravensdale, which are on a secondary road just east of Wash. 169 (map location 9). **9**

MINES YOU CAN VISIT

Wash. 507.—Five miles northeast of Centralia, which is on Interstate 5, is a large strip mine (map location 10) that produces coal for a 1,400–megawatt steam electric plant. Conducted tours are available June to September.

GHOST TOWNS AND HISTORICAL SITES

Although Washington has no real ghost towns, the following, with map locations in parentheses, should prove of special interest to the historical-mining oriented tourist:

4 Northport (map location 4), Wash. 25.
11 Orient (map location 11), U.S. 395.
12 Liberty (map location 12), U.S. 97.
13 Monte Cristo (map location 13), Sauk River County Road.
14 Nighthawk (map location 14), U.S. 97 about 12 miles northwest of Orville.
15 Molson (map location 15), from Oroville take Tonasket Creek Road east for 7 miles, then turn north on Mud Lake Valley Road for 6 miles.
16 17 Old Toroda (map location 16) and Bodie (map location 17). From Wauconda on Wash. 20, take the gravel road 6 miles northeast to Old Toroda and another 9 miles to Bodie.
18 Conconully (map location 18), Wash. 215. Approximately 20 miles north of Omak, which is the eastern portal of the new North Cascades Highway.

FOR MORE INFORMATION WRITE OR VISIT

Federal Bureau of Mines Liaison Office, 909 Capitol Center Building, Olympia, Wash. 98501.

Federal Bureau of Mines—Western Field Operation Center, East 315 Montgomery, Spokane, Wash. 99207.

Washington State Division of Geology and Earth Resources, 1404 Jefferson Street, Olympia, Wash. 98504.

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Inventory of Washington Minerals, Part II, Metallic Minerals. Washington State Division of Geology and Earth Resources, Bull. 37, Olympia, Wash. 1956, 428 pp.

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U.S. DEPARTMENT OF THE INTERIOR BUREAU OF MINES

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interests of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in Island Territories under U.S. administration.

MARCH 3, 1849